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A

TREATISE

ON THE

DISEASES AND ORGANIC LESIONS

OF THE

HEART

AND

GREAT VESSELS.

BY

J. N. CORVISART, M.D.

FIRST PHYSICIAN TO THEIR IMPERIAL AND ROYAL MAJESTIES, BARON OF THE EMPIRE, OFFICER OF THE LEGION OF HONOUR, MEMBER OF THE INSTITUTE, AND OF THE ACADEMIES OF VIENNA, MADRID, NAPLES, PETERSBURGH, &c. &c. &c.

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TRANSLATED FROM THE FRENCH,

BY

C. H. HEBB,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS IN LONDON.

HÆRET LATERI LETHALIS ARUNDO.

Virg. Æneid.

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TO

BENJAMIN FONSECA OUTRAM, M. D.

MEMBER OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON, &c. &c.

DEAR SIR,

ALLOW me the pleasure of dedicating the following Translation to you: because, while I know no one more competent to appreciate its merits and demerits, I can rely with confidence on your viewing the latter through that friendly medium, which cannot fail to be favourable to the feelings and professional reputation of,

Dear Sir,

Your faithful Friend and Servant,

C. H. HEBB.

Worcester, 1st *March*, 1813.

ADVERTISEMENT.

IN venturing to offer the following Translation to the Medical World, I was chiefly influenced by a belief, that our language did not possess a comprehensive and systematic Treatise on Diseases of the Heart. Mr. Allan Burns will, I am sure, excuse me if I do not consider his Work, valuable as it is, precisely in that light, and for this good reason, that he does not profess so to consider it himself.

It has been my chief aim, in the Translation, to be faithful to the meaning of my Author: in endeavouring to attain that end, I have, doubtless, not entirely divested him of his native dress, but have left him sufficiently cloathed with Gallicisms to point out the country of his birth. This, however, is a fault, I hope, not beyond forgiveness, more particularly if the sense be, notwithstanding, as readily and perfectly conveyed, as though it were dressed up in the purest English periods.

Those who may be inclined to visit such a fault with the fulness of critical censure, will, I trust, be disposed, at the same time, to make some allowance for the different circumstances under which an Author and a Translator are placed. The former labours in his own undoubted and indisputable freehold, dreads no intruders, and may with safety listen to and follow the advice of Horace;—*nonum prematur in annum*. A Translator, on the contrary, has no exclusive property in the soil which he attempts to cultivate. The game he seeks, of the migratory kind, and the produce of a foreign land, may be considered in the light of *ferœ naturæ*, equally exposed and obnoxious to the fowling-piece of every literary sportsman, whether qualified or unqualified. The necessary consequence of this is, that every Translator exerts himself under fears and apprehensions, which induce him to hurry his efforts, lest some unknown, and, as it might turn out, more fortunate adventurer than himself, should snatch from him the reward of those efforts, even perhaps, at the moment when he thought it completely within his grasp.

I have also to apologize for many minor and typographical errors, which must inevitably have crept into a Work, written in haste, during hours stolen from professional avocations, and by one who makes no pretensions to the dignity of authorship. As my prototype pleaded something of the same kind in palliation of his style and inaccuracies, and, it would seem, did not plead in vain; I am under no apprehension of meeting with a less liberal and exculpatory spirit from a British Public, than he found from a Gallic one.

C. H. H.

1st March, 1813.

ADVERTISEMENT OF THE AUTHOR.

THE first Edition of this Work having been long exhausted, I offer a second to the Public. The reader who has leisure to compare this with the former, will readily perceive the many corrections which I have made, the reflections which I have added, the explanations which I have hazarded, and the numerous cases with which I have enlarged it.

The basis of the Work remains the same; for being a performance of a purely practical nature, upon a peculiar species of diseases, founded on observation, its ground-work did not appear to me to admit of any material alteration.

Nor, indeed, is there any striking variation from the plan adopted in the first edition; for, notwithstanding its manifest imperfections, I was unable to devise a better: it appeared well adapted to a satisfactory division of the subject, which I

proposed to discuss. The present Work may be considered as nearly a complete History *(monographie)* of all or most of the Diseases to which the Heart, its coverings, and its appendages, are liable. Now as different tissues *(tissus)* enter into the composition of this organ and its dependencies, I thought that the surest way not to omit any of their diseases would be to treat separately of the diseases of each individual tissue, and then of those which appear at one and the same time to attack them all. This work therefore divides itself into five Classes.

The first treats of the Diseases *of the Membranous Coverings of the Heart.*

The second of the Diseases *of its Muscular Substance.*

The third of the Diseases *of its Fibrous or Tendinous Tissue.*

The fourth of those Diseases *which, at one and the same time, affect many Tissues of this Organ, and of those unnatural States which may be considered as so many Organic Lesions of the Heart.*

In the fifth, I briefly treat of *Aneurisms of the Aorta*, and for a moment direct the reader's attention to the red colour which is often observed on the internal Membrane of this Artery.

The Appendices, which, in the former edition, were placed at the end of each Section, are, in the present, incorporated with the different divisions of the Work to which they relate; whereby the attention of the reader will be less distracted, and my own Cases or remarks will be at once fortified by what has been adduced from other Authors in illustration of the subject. In treating of the Non-occlusion of the Foramen Ovale, and of the Preternatural Opening in the Septum of the Ventricles, I thought it right to advert to the *Blue Disease* of certain modern Authors, upon which I have made such remarks as my experience suggested.

I conclude, as in the first edition, with Corollaries on the causes, signs, progress, prognosis and treatment of Diseases of the Heart; and on the means of distinguishing them from other Diseases with which they have often been confounded: Finally, the State of the Dead Subject, the Decomposition of the Blood after Death, succinct Observations on Polypous Concretions, have not entirely escaped my attention,

and are not omitted here: In these articles are introduced many remarks not to be found in the first edition. I cannot disguise one serious inconvenience arising from this arrangement; that of being precluded from treating under the same Class on Inflammation of the Pericardium and that of the Heart: since *Pericarditis* belongs to the Diseases of the Coverings, or to the First Class; and *Carditis* to the Fourth. I hope to be forgiven for this fault, naturally arising from the plan of my Work.

I have also to crave pardon for some typographical errors. With respect to style, as the nature of the subject scarcely admits of an agreeable or elevated one, the interest of the reader must be derived rather from the topics themselves than from the manner in which they are discussed. Besides, a nice attention to this point would inevitably have imposed a heavier tax upon my time, than I was able to pay. Finally, I must allow that the definition which I have given of what I mean by *Organic Diseases*, has not escaped just and severe criticism. I willingly let judgment go by default on this subject, for controversy is not to my taste; besides, every mind has its bias and its limits, and I have given the reins to mine; if I had endeavoured to write better, probably I should have

written worse; *in vitium ducit culpæ fuga.* My sole object has been to call the too much diverted attention of Physicians to the frequent Diseases of that Organ, which, next to the Lungs, is the most laboriously and incessantly employed in the human frame. The cases which are multiplying daily, the different Treatises which have appeared since the first edition of my Work, those which may be in preparation, convince me that I have attained that object. I hope the service thus rendered to science by long study, by numerous, exact, and authentic observations, will be an excuse for the imperfections of my style.

ERRATA.

Page.	Line.	
2	8	For *tell* read *tells.*
3	26	For *analagous* read *analogous.*
15	7	For *charges* read *changes.*
27	24	For *canalis* read *canaliculus.*
170	35	For *superceded* read *superadded.*
185	33	For *little but* read *but little.*
200	5	Put *be,* before *described.*
225	17	For *cavities* read *cavity.*
284	22	Put *the,* before *afflux.*
285	7	Put a *comma* after *retrocession,* and *dele period.*
319	9	For *indulgencies* read *indulgences.*
341	7	Put a *comma* after *secretions.*
350	14	For *first* read *fist.*
379	6	For *idopathic* read *idiopathic.*
386	6	For *internal* read *external.*

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PRELIMINARY

PRELIMINARY DISCOURSE.

I CALL *organic Lesion*, every species of alteration which takes place, from whatever cause, in the elements, in the texture of solid parts; a certain determinate concurrence and arrangement of which are necessary to form an organ, or viscus, to establish its action, the law and manner of that action, its duration, &c. These Lesions are much more frequent than Physicians have hitherto imagined, judging from the extraordinary silence of authors on this numerous class of diseases.

It is not my intention to speak of all the known organic Lesions; because, on the one hand, I should encroach on the extensive province of Surgery, were I to advert to the immense variety of external causes acting as well outwardly as inwardly; on the other, I should far exceed the limits which I have prescribed to myself in this work and its principal object.

I endeavour to prove, in the first place, summarily, that internal organic Lesions are not uncommon; I afterwards, confine myself to an inquiry into the organic Lesions of the Heart, and endeavour to demonstrate their frequency.

The first question which naturally presents itself is, whence has arisen the neglect of Physicians to inquire into these diseases? Doubtless the strongest reason, at least as far as regards the ancients, was their ignorance of anatomy; their respect for the dead prevented them from cultivating this science; Galen, history tell us, made a voyage to Alexandria to see a human skeleton. If this proves his zeal, it also proves his ignorance of human anatomy. For want of human subjects they dissected monkeys; but supposing these could always be procured, it is evident, notwithstanding the similarity of their organs to the human, that the ancients would not much occupy themselves in dissections which gave them such dubious information, and which must have painfully sharpened their desire for human anatomy, the study of which was interdicted by their civil, political, and religious institutions. Hence it is not very surprising that they should have said nothing on organic Lesions.

The ages of barbarism, which afterwards for so long a period desolated Europe, were not favourable to the study of anatomy, and it was not this branch of medicine which science, a refugee among the Arabians, laboured to enrich: hence their authors furnish no works of importance on internal organic diseases.

On the revival of letters in Italy, in France, and successively in the other countries of Europe, in proportion as civilization endeavoured to re-establish herself, and learning to dissipate the darkness of the profoundest ignorance, the sciences were cultivated, and anatomy rose to a height which has not been disgraced by the brilliant discoveries of the moderns, so that the point which it has now attained leaves but a gloomy prospect for future anatomists.

On the other hand, anatomists, entirely occupied in developing the minute structure of parts, were almost all of them neglectful of what related to the organic Lesions of the viscera. Many, however, noticed those which chance presented to them, and these scattered observations gave birth to works of merit, some of which have even immortalized their authors; it is sufficient in proof of my assertion to name *Morgagni*. But his excellent work, a monument of judicious and vast erudition, has rather served to supply ornaments for the writings of other Physicians, than to promote or accelerate the knowledge of organic diseases.*

* In one of the Memoirs which I formerly read to the Institute, I threw out the idea of a work, analagous to that of Morgagni, but in an inverse sense. It would have been entitled, *De sedibus et causis morborum per signa diagnostica investigatis et per anatomen confirmatis.* But for such a work another Morgagni is necessary.

The sole end of practical medicine should be not from a barren curiosity to seek out singular appearances in the dead subject, but to enable ourselves to distinguish diseases by certain signs, by invariable symptoms; yet, even at this day, men are to be found hardy enough to maintain, that to cure diseases, it is not necessary to be well acquainted with them;‡ and it cannot be denied that this miserable assertion has found defenders even among those who pretend to be Physicians. From hence springs the vulgar notion, that the minute researches of anatomy are useless to the Physician. I hesitate not to affirm that this opinion, which has much promoted the neglect of the study of practical medicine, is one of the principal causes of the little progress that our art has made in the knowledge of organic diseases. *Morgagni* maintains it as part of his text.

That this source of ignorance and error may be more powerfully felt, let us apply to all organic diseases, what *Senac* says of those of

‡ In the present day matters are carried still farther; for it is maintained that the certainty of diagnosis, in diseases of the heart, is useless, because they are incurable:—that this should be the language of men of the world is not surprising, but that soi-disant Physicians should dare to maintain such a paradox, is matter of astonishment! It is well for them, that it may be said, *art is short, life long, experience silent, judgment nothing, &c.*

the heart; "if we are ignorant of them," says he, "we shall pronounce rashly on an infinite number of cases; we shall fatigue our patients with hurtful or useless remedies; we shall hasten death by treating some diseases like those which are of a totally different nature; we shall be exposed to shameful discoveries by the opening of bodies; finally, danger will be at hand when we think it at a distance." How many practitioners have escaped those shameful truths, with which *Senac* threatened those of his day, by prudently declining to inform themselves, by the opening of the dead body, of those mistakes which their ignorance of anatomy had caused them to commit.

If, then, it has been proved, as many authors have thought, whose opinion cannot be challenged, that the want of an accurate and extensive knowledge of anatomy, is necessarily accompanied by ignorance of most organic Lesions, the converse of the proposition presents itself: *the more minute anatomy is cultivated by Physicians, the sooner will they be enabled by just observations to ascertain and prove the existence of a great number of organic Lesions, of which most of them had not the slightest suspicion.*

But it would be a great error to imagine, that the mere dissection of dead bodies is suffi-

cient for the attainment of this end; far from it: the Physician who does not combine physiology* with anatomy, will always remain, in truth, a more or less able dissector, industrious and patient; but his practice will be ever wavering and uncertain, particularly in the treatment of the Lesions of Organs. How many have I heard utter by the bedside of their patients false diagnostics, some accusing the liver, or the stomach of derangement, when the complaint was in the chest, and vice versa: others, mistaking for every kind of dropsy, for asthma, &c. a disease of the heart, &c. and in fine, I can affirm, with truth, that I have known every organ falsely accused of being diseased, or otherwise, by persons who were not entirely deficient in anatomical knowledge. What, then, is the source of such mistakes? I have before said, it is the want of a correct knowledge of physiology. Without it, in effect, of what use is anatomy? It is not sufficient for the Physician that he be acquainted with all the springs of the human body, that he know them by their names, their forms, their actual and relative situations, and even, if possible, by their principles; if he do

* When I use the word *physiology*, I mean, once for all, the physiology of observation, pathological physiology, (always guarding against the too easy inductions of analogy), and not systematic physiology, which often supposes and always explains.

not animate by mind all the movements of this astonishing machine; if, besides reading the best works on this important subject, he do not incessantly study in the living man all the perceptible phenomena of the action of parts; if he do not constantly compare the sensible and proper phenomena of the life and health of every organ with those which each presents when diseased,* how will he be able to discover and distinguish with certainty, those organic derangements which merely threaten, or which are confirmed?

I have said *sensible phenomena*, for it must be confessed that whatever may be the perspicacity of the most subtle physiologist, he is still very far from comprehending intuitively, and by unequivocal signs, the minute and proper action of each organ, so as never to confound it, for example, with phenomena, purely sympathetic.

We must allow, on the other hand, that those minute movements which exist in the interior of viscera, and which not being perceptible from without, are beyond the reach of our senses, place limits evidently too narrow for positive physiology, and open too wide a field for

* It is this which constitutes pathological physiology, without which almost every thing is vague and uncertain in clinical medicine.

systematic and abstract physiology. And it is, unfortunately, by disturbing the laws and actions of these minute movements of the viscera, that nature lays the hidden foundations of organic diseases, which are almost sure to be discovered at too late a period to admit of cure.

I say more; all men ought to be, to a true Physician, a moving picture, perpetually presented to his observation; incessantly should he apply himself to the study, not only of the physical, but of the moral man: and (excepting that link, which unites this two-fold being, and which is for ever hidden from our researches,) the Physician ought to attend to even the slightest perceptible influences of the one upon the other, and of their reciprocity of action. In truth, he will be the greatest Physician who shall be the most profoundly versed in the phylosophy of mind, as he will perceive, with a more accurate eye, the subtler phenomena of life, and will foresee, at the greatest distance, the kind of disease which may threaten any individual, except in violent and extraordinary cases.

Where, may we exclaim, shall we find so clear-sighted a Physician? Nowhere, I readily admit; but I am not, on that account, the less fully convinced that one of those qualities on which the *tact* of a great Physician is firmly

established, consists in that penetration, incessantly strenghtened by exercise, which enables him to perceive in any given patient, the scene of his moral affections, while he observes all the physical phenomena which point them out, which produce or which result from them: the history of Antiochus and Erasistratus is sufficiently known!

In truth, to what errors does that Physician expose himself in his professional career, who neglects the important study of moral man? The slighest attention to the social state, particularly in large cities, where all the passions, and all the vices, in all their shades, and under all their possible forms, animate, excite, and put into motion the whole system, and above all the nervous, in a thousand various and opposite ways, affords striking and daily proof of this assertion; and if we reflect, moreover, on the disturbance thus produced in the viscera throughout the whole economy, we shall find all the functions, more or less, disordered by these ever-agitating or ever-renewing causes: we shall behold the inadvertent Physician losing himself in conjectures, fluctuating in his opinions, bewildering himself in the choice of his means, and almost always deceived in the results which he promised himself.

Into what still greater errors will not the Physician find himself betrayed, who does not join to the attention due to the influence of every kind of passion and affection, that distrust which ought naturally to be excited, under a thousand different circumstances, by the fallacious resemblances of a host of counterfeited complaints? Need I cite feigned nervous affections, carried sometimes so far as to resemble epilepsy or catalepsy, false hemorrhages, distortion of a limb or limbs, artificial ulcers, &c.? Shall I speak of gestation feigned, when it does not exist, or denied when it does, of extraneous substances introduced into different cavities, &c.? Here, at least, such of the phenomena of these fictitious diseases as are perceptible to the senses, may be readily discerned by the clear-sighted Physician;* but what shall I say of those still more complete traps which are sometimes laid for him, and by what signs shall he detect pretended pains in the head, of the stomach, and of rheumatism, &c? The most cautious cannot always escape from these insidious declarations. This picture might be enlarged by the exaggerations which patients sometimes make of real com-

* Is there a Physician who has practised in hospitals, who has had the care of soldiers, or the inspection of persons soliciting admission into alms-houses, &c. for whom these snares have not been often laid?

plaints, either to excite greater sympathy among their friends, or fix more firmly the attention of the Physician.

It is thus, that too often placed between truth and falshood, the credulous, inexperienced, and over confident Physician, has repeatedly found himself the plaything and laughing stock of perfidious men, the involuntary instrument of dark intrigues, or of culpable interests, whereby his reputation has sometimes sustained serious injuries; thus, adding to the real difficulties of medicine, society mingles together all the complexities that her passions and her interests can furnish, and then repeats the old accusation, that "*medicine is a conjectural art.*"

I should push too far this digression, already sufficiently extended, if, by way of recrimination, I were to inquire into the comparative degree of Uncertainty, and even of Quackery, in most of the other sciences, and even in the arts.* I shall only observe, that whatever may be the imputed uncertainty of medicine, every thing around her conspires, in an indefinite degree,

* Have not legislation, politics, the art of war, and many other arts and sciences, their conjectural parts? and, moreover, are not a thousand snares spread to create uncertainty and hesitation in minds which do not possess that energy, that rare genius which makes first-rate lawyers, profound statemen and great captains?

to increase it, according to the force and number of the snares and the obstacles which are perpetually impeding her progress. But to return:

I have endeavoured to prove, that if organic diseases in their number and their history are not yet well understood, that if we are often in error on this head, the fault, since the revival of letters, has been owing to Physicians who have either been ignorant of or neglected anatomy combined with physiology, such as I have described it; that this fault has necessarily led to another, that of neglecting the opening of bodies; while, from this cause, arise frequent and gross mistakes, such as substituting effects for causes, taking one disease for another, &c.*

It is, I doubt not, to this neglect of the study of anatomy, united to the physiology of observation, that must be attributed the propensity of most young Physicians to theories and systems, and to the explanations which flow from them, until experience has regulated the only principles which are worthy to be preserved, effaced from their memories the false impressions which the imagination had improperly engraven

* The numerous dissections which I have myself made, together with those made by others, have established, even to demonstration, what I have so much experienced, and a thousand times repeated, that organic diseases of all kinds are so common, that it was unusual to open a body which did not present some one or other of them.

there, and established their judgment on the deserted footing of experience and observation. I have endeavoured also to prove, en passant, that the knowledge of morals or of the human heart, is often not less necessary than that of the body, to enable the philosophical Physician to avoid a multiplicity of errors of another description.

With more leisure and more taste for abstract inquiries, I might have fortified this part of my discourse by reflections and metaphysical proofs borrowed from the gravest authorities; yet, if enough has been said for the candid reader, my end is attained. But it is not sufficient to have established the causes of the ignorance of the common existence of organic diseases, or of the oblivion in which they have been left; let me prove why they must be frequent.

That parts of our organs should undergo change and Lesion from the mere circumstance of their own action, is an idea on which the greater number of authors have not condescended to dwell. To say that our organs are liable to wear or become altered, according to the duration, the intensity or the irregularity of their action, is, in their view, to dwell on trifling considerations; it is to compare the human body to a machine, to confound it, truly with the more or less perfect productions of the me-

chanic arts. These exaggerated reproaches, often assisted by ridicule, have diverted the attention of Physicians from this point of observation; and, the imagination always directed towards the abstract study of the principle of life, its nature, its laws, its preserving and renovating powers, they have neglected to attend to the gradual or accidental waste which must take place in the human machine from its own action alone.

I am far from refusing the just tribute of praise due to the efforts of those superior minds who have endeavoured to throw some light on the obscurity which covers the nature of that principle which animates living creatures, which keeps up the functions of their organs, which incessantly repairs, *as far as it is possible*, the damage caused by their own action, or by that of hurtful agents, as well internal as external. This is a sublime inquiry, and can only be the patrimony of a small number of minds, at once solid and brilliant, who are sure, under the guidance of an unalterable system, not to be led astray in these lofty and abstract contemplations.

But, supposing that their profound meditations have led them to the discovery of some of the laws of a principle, of the true nature of which they admit that they are still ignorant; it

does not the less follow that the organs which it puts into motion should not be liable, by their own action, or by that of a thousand various agents, to changes, from which this moving, preserving and renovating principle cannot always completely defend them; and it is the frequency of these charges, an inquiry into which has been too much neglected, which I attempt to prove.

May I be permitted to make a comparison, the great inadequacy and even almost impropriety of which no one more readily perceives than myself? I compare then the human body to a *machine*;* it is true that the united powers of art can never produce one equally complicated and equally complete in admirable and perfect harmony; but let us suppose the best that it can do; in the *machines* which it produces, the matter put into motion, the principle of action of all their parts, the moving power itself are always known; air, the gases, steam,

* Whatever may be the principle of life, its nature or its power; and *taking it in the fullest extent of its unknown plenitude*, I banish it here from my remarks; and, to make myself better understood, taking into consideration only the materiality of the body, I inquire after the derangements of the parts of which it is composed; for, after all, the body alone falls under the cognizance of our senses, almost all the rest comes under the jurisdiction of metaphysics.

water, elasticity, weights, the lever, &c. in a word, the power and the resistance, and all the movements which result from them, are known and well nigh reduced to a nice calculation. There is nothing so well understood as this, nothing can be so mathematically calculated, in the human machine; here then, I admit, is an enormous difference.

The Mechanic sees the alterations in every part of his *machine*, he moderates, he suspends partially or totally its action, or he substitutes a new for a defective part.* Here again is a great difference.

What the mechanic does in one case, the vital principle does in the other; it does it, it is true, mediately, that is, through the medium of elementary principles, which it seizes, elaborates and applies, and this even by means of the parts themselves which it animates; and here again is an immense difference.

But whatever may be the efforts of the mechanic; whatever may be the power of the occult faculties of the principle of life, the wheels of the *machine*, and the organs of the body, are not the less perpetually exposed to

* In medicine, art may discover changes in certain parts; sometimes it can moderate but rarely can it suspend their action; and to substitute a good for a bad part is far beyond its power.

alterations, resulting from their own action, as well as to those which arise from the crowd of external agents, which, overpowering the resistance of these principles, produce derangements in their constituent parts, which may be viewed, in the *machine*, as in the human body, as so many proper organic diseases.

And these organic derangements will be proportionate to the activity or energy of action of the *machine*, or of the organs, or of the power of the destructive agent on the one hand, and to the solidity and consequently to the resistance of the organization on the other; so that the agent and the action being equal, the *machine*, or the body, will resist, more or less powerfully, according as the parts of the one, or the organs of the other may be formed of the best materials, the most perfect and exact shapes and proportions.

The human machine will, therefore, resist whatever tends to change its organization, in the exact proportion in which that organization was originally good: this is evident, notwithstanding the vital principle and its power, whatever system we may adopt.

By an inverse reasoning, then, the human body will resist these changes less powerfully in proportion as the elements of its organs, their texture, their affinity, &c. may be weaker, more

vitiated, worse arranged, or less harmonious in their action.

And this vicious assemblage may be so great as to constitute a body, which shall resist the vital principle itself, that is, shall not be capable of living. Such are monsters vegetating in the womb that nourishes them, but perishing immediately, or more or less promptly, when, quitting their borrowed life, they appear in that world for which they never were intended.

Now, between the impossibility of living in consequence of a monstrous conformation, and that perfection of organization which gives the power of attaining the most extraordinary longevity, the degrees of deficiency in organic perfection are not the less real, because incalculable.

It is then a melancholy but indisputable truth, that death, as to a vast majority of beings, will necessarily take place in the various gradations between these two extremes.

And medicine would have reached a high degree of fundamental knowledge, if it could teach us how to calculate the degree of vitality in every being abstractedly; that is, by a calculation of the goodness of its organs, independently of the action of destructive external causes, &c.

If a mathematical precision on this head is evidently impossible, still it would be judging absurdly, or discovering singular incredulity, to deny, that this science is gifted with some approximating power. An unremitting attention, a well disciplined penetration, senses which convey just impressions to a sound judgment, are calculated to fortify and confirm this approximating power, the only one which can be attained.

If to the undeniable fact that by defects of organization, as well as by the simple action of parts possessing a good organization, a great number of men must perish at different periods of their career, be added, the immense series of physical and moral causes which attack life, as well from without as from within, we shall be astonished that the daily mortality is not still greater than it is; and here we may see the triumph of the vital principle in organized beings.

Now consider the physician imbued with these profound truths, to whom a multitude of beings, doomed to an end improperly called precocious, repair to demand days which their constitution has denied them, who brought with them, at their birth, the germ of a life of sorrow and of premature death, and then learn

how to appreciate the reproaches of the vulgar, and the sarcasms of the witty.‡

Let us, then, admit that it is as absurd for a crowd of badly organized individuals to seek health from the art of the Physician, and to aspire to longevity, as it would be ridiculous to expect the most celebrated architect to render solid and durable a house built against every principle of artichitecture, and with the worst materials. One house is scarcely finished, before it totters to its fall, in spite of all the resources of art; while another edifice, on immoveable foundations, will, for a long time at least, bid defiance to the lapse of ages and the efforts of the elements.

Thus we sometimes meet with privileged beings to whom nothing is an excess or an abuse, while there are others whom every thing appears to injure, against whom every thing appears to conspire. May there not be

‡ Who has not quoted to some physician, (with that air of superiority which arises from confidence in an argument supposing itself unanswerable) that sophism of J. J. Rousseau, that *physic should come without the physician?* He might also have said that diseases should come without patients, and in following up this ridiculous idea, why did he not wish for natural philosophy without natural philosophers, arts without artists, &c. In a word, as well might one ask for the world without inhabitants. Moliere, and the author of *Gil Blas*, have hit the mark better!

given to all created beings a certain sum of life, in the division of which some shall receive more and others less? And must not the former necessarily consume or lavish their excess, without the possibility of turning it to the advantage of the latter? An idle question, because incapable of solution.*

But let us lay aside all these abstract considerations, and discard the crowd of ideas to which they give birth; in short, let us confine ourselves to the principal question. I hope I have said enough to prevent any one from denying:

That organic diseases are more frequent than has hitherto been supposed.

That Physicians, in all ages, have neglected the researches proper to convince them of this fact.

That a great number of these Lesions, or a disposition to them, are often hereditary, original, or constitutional.

That whatever may be the power of life, or the energy of the vital principle, that power, that energy, can never be sufficient to defend the springs of a bad organization, or even of a good one, against the waste or changes to which

* How singular is the contrast between the care which we take in preserving and improving the breed of animals, and the thousand intermixtures of every species of vicious conformation, virus, &c. among mankind!

they are exposed, as well from their own functions, as from internal and external causes.

Let us now see if the organic diseases of the heart ought to occupy a principal place among these too numerous Lesions.

I affirm, without hesitation, that the most frequent organic diseases, pulmonary consumption excepted, are those of the heart. ‡ And

‡ To prove this assertion, let us only compare the position, the structure and the action of the two organs.

The heart, in the region which it occupies, is defended from every impression or direct modification on the part of the air and its variable, frequent, and sudden changes of temperature: we may maintain, generally, that it is not sensibly affected by it, and that it contracts no diseases from it; we may say that it lives in a *medium*, always the same as to temperature.

The lungs, although occupying likewise the interior of the chest, are, through the immense extent of their internal surface, in immediate and perpetual communication and necessary contact with the external air: how many morbific causes at once arise from this simple contact, whether by temperature, (let us only compare the difference of the temperature of the air under the poles and under the equator, at Senegal, &c.) or as the vehicle of a crowd of known and unknown miasmata. What numerous catarrhs, pleurisies, and their consequences; in fine, how many catarrhal and inflammatory affections, acute and chronic, sporadic and epidemic, malignant and pestilential, &c.! how many dyspnœas, &c. originate in this one cause of situation, with its incidental circumstances. The structure of the heart is simple, easy to be understood; it is strong and solid, and its action is not difficult to comprehend.

without passing in review the principal organs of the body, and the many Lesions of different kinds with which I have seen them affected, I maintain, that those of the heart have offered themselves more frequently than others to my inquiries, as well in the Hospital of la Charité as in private practice. Now, as there is no good reason why patients labouring under these affec-

The structure of the lungs is spongy, delicate, complicated; and scarcely are anatomists, at this moment, agreed on its minute organization; the difference, however, in what is known is great. Lastly, one may say, that the action of the heart is simple and limited, almost entirely mechanical; to dilate, to receive the blood, to contract to give it to itself, and to drive it, more or less powerfully, to all parts of the body, according to its own strength, or according to the degree in which it is stimulated by it, appears to be nearly its office; I do not know that it has ever been considered as a secreting organ.

What an immense difference in the action of the lungs! we may regard it in a physical or mechanical, and in a chymical point of view. In a mechanical; speaking, crying, singing, declaiming, playing on wind instruments, the excess and abuse of these acts in various temperatures, in the open air, against the wind, &c. how many injuries of this organ must result from these causes alone! And yet, in this view, the lungs are sometimes at rest.

In a chymical! We know not the extent or limits of their chymical action, and we never shall know them, notwithstanding all the discoveries of the moderns; to change the temperature of the air inhaled by them; to decompose it, by robbing it of its own and giving it other elements;

tions should have particularly offered themselves at this hospital, one may fairly contend, that nearly an equal proportion may be found in other hospitals and in general private practice. And if as, I believe, is proved in this work, the greater number of asthmas, dropsies of the chest, leucophlegmasiæ, originate in a disease of the heart, if error on this subject is common in public asylums, and probably equally so in private practice, we may boldly conclude that death by organic Lesion of the heart, is much

to be, according to some, the furnace and source of animal heat, to complete, in a great degree, the important work of sanguification, to assimilate the chyle, to *sift*, as through a *living sieve*, the deleterious or vitiated particles of the blood, as it passes through them ; to be consequently in perpetual contact with the external and internal elements of all the miasmata, and all the viruses, and yet not to absorb some, while it expels others ; to be at once a secreting and excreting organ, incessantly in motion, whether in health or disease, &c. what power and what importance of action : but what a fertile source of diseases ! what a profound spring of reflections ; what an object, at once, of wonder and humiliation to a mind ingenuous and exempt from common vanity ! On viewing this sketch, which the limits of a note will not permit me to complete, what reader will not be deeply affected with a sense of the truth of what I have advanced.*

* If this comparison were followed up with method through all the windings of which it is capable, the result would be a philosophical and pathological Treatise of the highest importance.

less rare than that by Lesion of the brain, of the stomach, of the liver, of the spleen, of the kidneys, &c. perhaps than even by all these united. This assertion appears to me so demonstrated, that I think it superfluous to attempt any calculations on the subject.*

But whence, it may be asked, arises the frequency of these diseases? Doubtless, from a great variety of causes, but chiefly from two; the action of the organ, and the passions of man.

I have already assserted, and I hope have proved, that our organs, in spite of the preserving and renovating operations of the vital principle, may become injured merely by their own action. Where, then, is the organ whose continuance of action can be compared to that of the heart? There is not one.‡ Bichat has truly said, that the organs of animal life have their *intermission of action;* he also equally well observed, that those of organic life do not always act with the

* All that has been done and said on organic diseases of the heart since the publication of this work, sufficiently avenges me for the pitiful reproach which has been cast upon me, that I saw diseases of the heart everywhere. I confess that I believe I possess a clearer penetration and a sounder judgment, than such a light assertion supposes me to do.

‡ It must not be forgotten, that I have excepted the lungs from all these considerations.

same intensity, and he might justly have called this diminution, *remission of action;* while the heart alone has, absolutely speaking, neither intermission nor remission, but truly *perennity of action.*

Let us view the embryo; scarcely can we discover its rudiments, yet we see the heart beat, we see the *punctum saliens* of Harvey. Now, from this *punctum saliens*; nay, doubtless from an earlier period to the death produced by age, a space we will suppose of ninety years, who has numbered the millions of pulsations which the heart must have beat without one moment's repose? This number amounts to 2 milliards, 838 millions, 240 thousands, beginning only from the moment of birth, and allowing only 60 pulsations in a minute.

It would be astonishing, even if the heart accomplished this immense series of pulsations without any thing to disturb it, without any thing to compel it to more frequent and powerful efforts! but how far is its action from being uniform and moderate? At first, without doubt, in the centre of the nascent embryo, the organs of the trunk, the head, the extremities, all vegetate and grow, but in the almost absolute quiescence of their proper functions. The heart alone began first its own *function*, and alone for a long time continues it, imparting life

to all the others; but who knows what exertions it even at this time must make, what obstacles are even then opposed to it, by the mere resistance of the parts which, in some measure, live and grow by its efforts, what principles of irritation and obstruction shackle its action, either from the nature of the humours which are conveyed to it, or from moral influences on the part of the mother, &c. ?

But without speaking with too much confidence of the operation of these causes in deranging the organization, or at any rate in laying the foundation of future disorganization, by the action of other agents to which it may hereafter be exposed; look at the fœtus when detached from its mother: from that epoch, obstacles occur to the action of the heart to which it had not till then been exposed; and these obstacles, far from diminishing, during the progress of life, seem proportionally to increase.

Without speaking of the organic changes which take place soon after birth, such as the closing of the foramen ovale, the obliteration of the canalis arteriosus, the developement of the pulmonary artery, &c. what clogs spring from the simple act of respiration and its various modifications. The crying and squalling of infancy, laughing, weeping, dancing, running, leaping, wrestling, fencing, the use of wind in-

struments, reading, declaiming, singing, venery, and its excesses, exertions, and attitudes of every kind, cough, and all the other morbid affections of the organs of breathing, muscular action, atmospherical influences. Truly here is an alarming number of causes, whose effects are inevitably felt by the heart, and which are so many more or less powerful clogs to the ease, freedom, and regularity of its action ; and, what is very worthy of remark, all these causes compel the heart to more frequent and more powerful contractions ; so that we should not make a calculation far removed from the truth, if we were to add a third to the already enormous number of pulsations computed for the natural duration of life.*

Shall I venture to enlarge the picture, by adverting to the fetters opposed to the free action of the heart, by the nature or abuse of a thousand aliments, or seasonings, fermented liquors, acids, *viruses*, effluvia, trades, &c.? Certainly, if we yielded to the reflections which naturally flow from these considerations, we should almost regard existence, for a few hours, as a miracle ;

* Let these considerations be added to the note on the action of the lungs, let attention be paid to the immediate dependance, the mutual and reciprocal action of the lungs and heart, and can we still be astonished at the frequency of organic diseases in each of these viscera !

unless by an unreflecting boldness, or by giving the lie to our own conviction, we ventured to deny the evident influence of all these causes, in modifying the phenomena of the action of the heart.

But this is not all; let us finish the picture of the causes which affect the heart, either in augmenting the frequency of its pulsations, or in injuring the freedom of its action: let me speak of the influence of moral causes, and especially let me name the passions.

Who will deny the immense power of these causes? anger, fury, timidity, envy, jealousy, fear, terror, love, despair, joy, sadness, avarice, lust, ambition, revenge, unexpected events, sudden oppositions, and all the infinite shades of these passions, and of so many affections, the greater part of which are of an unkindly nature; some criminal, and many fatal in their consequences, but which are not less the sad lot of human nature. Finally, shall I venture to say, that, by a deplorable fatality, the noblest passions, the sublimest feelings, re-act also on the heart, and often derange its action.

I leave to the philosophical and political legislator the care of softening and disarming most of these passions by wise laws, or chastising them with just punishments; to the severe moralist, that of diverting from them, by good

precepts; to the energetic preacher, the task of turning from them, by alarming the conscience; to the elegant rhetorician, and to the ingenious and sensible poet, the art of terrifying the imagination by lively pictures. This moral medicine is doubtless necessary, but often as ineffectual as our own.

If any one can seriously deny, or even doubt the fatal physical influence of the passions upon the heart, it surely will be sufficient for him to know that it sometimes bursts in a fit of passion, and causes instant death; and I am not the only physician who have thought, that Organic Lesions of the heart were more frequent, during the horrible periods of the revolution, than in the usual calm of social order.

Now, whatever may be the limitations, or modifications, which any one is disposed to allow to the action of so many powerful causes, either physical or moral, upon the heart; who will deny, that being in continual motion, or because it is incessantly exposed to be disturbed in its action, it is likely to be, and, in effect is, the most liable of all the organs to be injured in its structure?

But why should a Lesion of trifling extent in appearance, as, for example, the contraction of an orifice, or the inconsiderable ossification

of a valve, lead to certain death? This, evidently, is a question which better becomes men of the world, than true physicians; it is therefore them I answer, and I hope to be pardoned if I revert to my old comparison, homely but striking.

I shall freely call the heart the main spring of the human machine; for let its action be suspended, but for a moment, and there is apparent death; let it cease altogether, and there is real and sudden death.* What more or less than this can take place in a machine?

Hence the general and the individual vitality of every organ, of every part, is necessarily dependant on the life and action of the heart: disturb that action and the disturbance will be felt throughout the whole economy. Now the manifest action of the heart is to give the principal impulse to the blood; that is, to the source of all the humours, of all the secretions, of all the repairing powers, of the matter of nutrition, &c.

Thus the disturbance induced on all sides, when the laws of the circulation are deranged,

* It will not, surely, be objected to me, that, in death, a capillary circulation still exists for some time; that the hair, the beard, &c. grow in a dead subject; I hope I shall not be thought ridiculous, if I say, a man may be dead although his beard sprout.

may be viewed either in the solids or in the fluids; but, for the sake of brevity, we will consider it only in the fluids, and particularly in the blood; what happens then to the blood in Organic Lesions of the heart? It does not undergo those regular movements which are necessary to it; its concoction, its consistency ceases to be what it ought to be, the change in the respiration adds to the deranged action of the heart, in injuring the constitution of the blood; the progression of the fluids is rather a tumultuous than a regular march; an occult but real chymistry no longer follows its accustomed laws, in its elementary attractions and repulsions, &c. the blood is ill made or becomes decomposed. Serum predominates, and is filtered and effused in all directions; the deteriorated blood becomes a bad stimulus to excite the action of the heart, of the brain, and of all the viscera; add to these derangements, physical and moral influences, &c. and it will be seen how, in running round this highly vitiated circle, inevitable death must close the melancholy scene.

Thus then, and perhaps contrary to the expectation of some who may read this work, we find, almost everywhere, the fatal prognostic of death; it never can be doubted when the disease is confirmed. Even the old adage will

here hardly apply "*principiis obsta,*" &c. I believe it may, sometimes, be possible to ward off these diseases, never to cure them.*

At length, let me conclude, and prove by considerations afflicting it is true, that in most cases, medicine can never turn aside the majority of causes which produce, by influences more or less powerful, organic diseases of the heart. I will repeat it, these causes are either physical or moral; how can we withdraw from the former all those who exercise professions, who cultivate arts, or who follow trades which expose them to great and sudden variations of temperature, or to noxious exhalations, which require extraordinary muscular exertions, or lead to excessive pulmonary action, all which disturb the regularity of the circulation, and eventually wound, primarily or consecutively, the principal agent of that function. As well might one, in a flight of philanthropical *mania,* pronounce the dissolution of society.

* I know there are some Physicians who think that they have cured diseases of the heart; if they were not yet become organic, it may be so; and I think some such examples may be found in this work; but if they were become organic; I much doubt the fact, and the principal proof will always be wanting.

But if it is impossible to withdraw from the physical causes of these diseases the greater part of those, who from an imperious necessity are exposed to them, who can banish moral causes? We must first deprive man of his passions; but to conceive of man without passions, is to conceive of a being without his attributes; it would be to have an idea of what is impossible; the thing implies contradiction.

However, let us soften the picture a little, and admit that there are in the social state, beings so happily born, so favourably situated, that art may withdraw them from the action of those causes which tend to produce Lesions of the heart: such are those on whom fortune has bestowed her favors, and who, born with mild passions, can, by listening to wise counsels, remove the fatal influence of physical causes, by abandoning exercises and professions which they followed from choice, and not from necessity; correcting, by means of the arts and the luxury which attends them, those inclemencies which cannot be controled, or migrating to milder and more regular climates; moderating by reason the force of the passions; checking by its aid their wanderings; directing them towards virtue, by happy inclinations, carefully cultivated.

But while the Physician triumphs by his art over those diseases which threaten individuals,

doubly privileged by fortune and disposition, how many will he see in the lower ranks abandoned by necessity to trades which must create these affections, and whose low propensities, base passions, and intractable and uncultivated minds will even anticipate the effect of whatever has a tendency to produce them.

Placed in the midst of this varied, complicated and strikingly contrasted scene, how much does the physician, worthy of the name, at once actor and spectator, feel the necessity of uniting philosophy to medicine; an alliance so expressly recommended by *Hippocrates*. That great man, who merited the title of *divine*, as well by his exalted wisdom and rare virtues, as by his vast acquirements in the art of healing, was far from thinking that this word would one day become, among mankind, the weapon of ridicule, a disgraceful epithet, or the signal of persecution. But with the true physician, with him who is capable of taking and keeping *the oath of Hippocrates*, with him who is truly imbued with the precepts contained in his book "*de decenti habitu*," philosophy will never be separated from medicine. If he find, after long and difficult studies, in the painful exercise of his art, that he has to bear up against false accusations, to undergo unjust judgments, to endure low

jealousies, and often to meet with ingratitude instead of reward, he will know how to rise superior to these ills, and console himself *with philosophy*.

TREATISE

TREATISE

ON THE

DISEASES OF THE HEART.

FIRST CLASS.

DISEASES OF THE MEMBRANOUS COVERINGS OF THE HEART.

General Observations.

ACCORDING to modern anatomists, the coverings of the heart are composed of two membranes of different kinds. The external one, unequally thick and fibrous, and irregularly distributed, does not much demand the attention of the physician, in respect to its organic changes; at any rate, I have never seen in the works of others, or in my own practice, any fact that led me to suspect a disease of this membrane. Yet why should it not, like all other solids of analagous structure, be the seat of rheumatic, gouty, and such like affections? The other, smooth, thin, and of the nature of those membranes, which have been called *serous*, is much more important to this organ, under the three-fold view, of its extent, its uses, and its

diseases. By the term membranous coverings of the heart, I mean then more particularly this membrane, closely adhering, on the one part, to the outside of the heart, and to the beginning of the great vessels, and united, nearly for the other half of its extent, to the external and fibrous lamina of the pericardium, and also to a portion of the upper surface of the diaphragm.

From the nature of its organization, the pericardium is liable to all the diseases of serous membranes; thus, a defective equilibrium between the action of the exhalant and absorbent vessels, gives rise to serous effusions proportionate to that defect; the pericardium is also susceptible of acute and chronic inflammation, the features of which resemble so much those of inflammation of membranes of a similar texture, as to leave no doubt, that their causes, signs and symptoms, are, if we may so express ourselves, identical. If some particular phenomena, if some more violent symptoms indicate a higher degree of danger in inflammation of the pericardium, they are clearly owing to its union, with one of the most esssential organs, the heart; the perfect and regular action of which is indispensable to a complete and uninterrupted state of health.

The adhesion of the pericardium to the diaphragm is one of the causes of the peculiar violence of the symptoms of inflammation of this membrane, of its being attended with faintings, a sense of suffocation, irregularity of breathing, great anxiety, &c. from the intimate connexion of the parts, from the pain and agony resulting from their necessary and constant mo-

tion, and from the usually spreading inflammation. Perfect rest is, doubtless, one of the first requisites in the treatment and cure of every inflamed part; but here the action of the heart and diaphragm being incapable of even a momentary suspension, we readily conceive, from their continued motion, which the disease itself increases, how intense must be the pain in inflammation of the pericardium. The same cause also renders highly painful inflammations of the pleura, of the lungs, of the peritoneum, and in general of all inflamed parts, which cannot be kept in a state of perfect quiescence.

The greater number of pathological states in which we find the pericardium, after its diseases, are the result of the degree of inflammation which it had previously undergone. *Pericarditis* ought, for this reason, to be placed at the head of the history of diseases of this membrane.

CHAPTER

CHAPTER THE FIRST.

Section 1.

OF PERICARDITIS IN GENERAL.

In common with all practitioners, I call pericarditis an inflammation of the whole or of a part of the serous membrane, which immediately invests and closely adheres to the heart in every part, and which moreover furnishes the loose bag in which it is contained.

This disease appears to originate in the same causes which excite inflammation in analogous membranes, such as a sanguineous constitution, the suppression of a nasal or an hæmorrhoidal hæmorrhage, of the menses, of perspiration from the sudden action of cold air on the body when much heated, immoderate exercises of the body and its cooling suddenly or slowly, partially or generally, excessive venery, inflammation of neighbouring parts, the use of iced drinks in summer, of spirituous liquors in any season, and, in general, errors or excesses in diet, the abuse of highly seasoned dishes, the metastasis of gouty, rheumatic and psorac humours, &c. great exertion of the mind, much watching, &c. Besides these general causes, the action of bodies striking upon the præcordial region appears to be a frequent exciting cause; an opinion which I am authorised to advance, as well from my own observations as those of other writers. Finally, this disease, like many others, frequently takes place, without our being able to assign any of the above occasional, or indeed

any other causes. Pericarditis, considered in all the cases which have been noticed, offers varieties with which it is necessary to be acquainted to have a precise knowledge of it, in all its possible shapes. In some cases its attack is extremely violent, its course rapid, and its termination speedy ; very rarely does it follow, in those instances, its usual progress by passing successively through all its different stages, but is so quick and powerful in its action, that it kills in the *augmentum* of the disease, amidst a tumult of violent and multiplied symptoms, which will be hereafter described.

Sometimes this disease is truly chronic ; its commencement is then insensible and hidden, its progress insidious and obscure, and its termination very slow. These different cases, doubtless, present rather successive and milder degrees of the same disease than true varieties.

The multiplied, and more or less dangerous complications of other diseases with acute, as well as with chronic pericarditis, too frequently add much to the difficulty of diagnosis ; and it is only by the most unremitting attention, and the nicest penetration, that we are enabled to discriminate in the mass of symptoms, those which mark the proper and primary affection of the pericardium.

FIRST.

OF ACUTE PERICARDITIS.

Acute inflammatiou of the pericardium, although generally less obscure than chronic, still frequently offers great difficulties to the

researches of the physician. Pleuropneumonia is generally complicated with it, and it is frequently very difficult to say which first appeared, or whether their commencement was not simultaneous. Its abrupt attack, its rapid course, and its almost sudden termination, hardly allow time to fix its character or seat; almost always complicated with a similar affection of the lungs, the pleura, the mediastinum, the diaphragm, and even sometimes of the stomach, the diagnosis is then the more uncertain, because, from the complication of symptoms and the multitude of phenomena, it is extremely difficult to ascertain which is the principal disease. We find, in fact, collected together most of the symptoms of pleuritis, peripneumonia, paraphrenitis, and, now and then, even of gastritis, and oftentimes the greater intensity, real or apparent, of some particular symptoms, masks those which are necessary to point out the true seat of the disease of which we are speaking. I have no proper case of acute pericarditis, without complication. I have a faint idea, however, that I have seen two or three such cases, but the collection of facts necessary to form an useful history of them I do not possess. I can therefore only cite those which are more or less complicated.

Case 1.—A man, aged 43 years, of a strong constitution, on the 10th of April, 1800, was suddenly seized, without any known cause or warning, with difficulty in breathing, and an acute pain in the lower and left region of the chest, spreading towards the epigastrium and the right hypochondrium, with a troublesome,

dry and painful cough; the expectoration was slight and not tinged with blood. A violent cold fit took place on the first night.

When he was admitted on the 12th into the Clinical Ward, he had no head-ach; the head was clear, the countenance hollow, the cheeks, the nose and the lips, were of a very deep red; there was a yellowishness round the orbits, the muscles of the face were agitated by slight convulsive motions; the tongue was moist, the pulse small, contracted, frequent, and rather hard, but not irregular; the breathing difficult, high, quick and interrupted; the cough dry and painful; the expectoration was slight and greyish, the region of the heart extremely painful; he had obscure palpitations; was costive, and no discharge of urine had taken place since the commencement of the disease.

Two bleedings from the arm on the same day, softening and anodyne remedies, with mild evacuants, afforded scarcely the slightest alleviation. The seat of pain became changed, and a blister entirely removed it. In spite of this momentary and local improvement, the situation of the patient becoming more dreadful, he passed the night of the 13th and 14th in great agitation and delirium, and died on the morning of the 14th, on the fifth day of the disease. On opening the body, I found a turbid and flaky fluid in the left cavity of the chest. The pleura on the inferior lobe of the left lung, on the upper surface of the diaphragm, was, as well as about one third of the lower outer surface of the pericardium, inflamed and covered with a pseudo-membranous crust. The substance

of the inferior lobe of the left lung, was hard and choaked; the cavity of the pericardium was filled with a sero-purulent fluid, slightly tinged with red; the inner surface of this membrane was covered with a yellow and very thick lymphatic exudation; the outside of the heart was rugose in its serous membrane only, for its muscular parts did not appear affected.

The various phenomena of the disease sufficiently prove, that, at its commencement, the inflammation, the focus of which was the pericardium, had attacked the diaphragmal and costal pleura, and a small portion of the inferior lobe of the left lung. Thus we find some of the phenomena of paraphrenitis overpowering, as it were, those of pericarditis, and reciprocally the symptoms of pericarditis, obscuring those of paraphrenitis. On the one side, we do not observe, the frequent syncopes, the burning pain in the region of the heart, the irregular vaccilation of the pulse, which principally characterize acute pericarditis: on the other, we do not perceive the risus sardonicus, the furious and continued delirium, and the convulsions, which according to almost all authors, (but which I think do not exclusively belong to this affection,) are more particularly characteristic of paraphrenitis. I may here observe, en passant, that I view many of the symptoms attributed to paraphrenitis, not only as equivocal, but even as erroneous. All is here obscurity and confusion, and the difficulty of discovering the true seat of the disease is proportionally great. Nevertheless, a careful analysis of each symptom does not permit us to mistake complicated pericarditis.

In this case, pericarditis was complicated with paraphrenitis and pleuro-peripneumonia; but general experience proves that it is most frequently complicated only with pleuro-peripneumonia.

In 1806, I witnessed two cases of pericarditis still more complicated, a brief account of which follows:

CASE 2.—In the month of February or March, I was called in consultation to a young lady, aged 23 years, a creole from Martinique, who came to France, for the first time, at the close of the preceding summer. She lay-in at Paris, with her fifth child, in the month of September. She began to suckle, gave it up, and in general, as I was informed, did not well manage her milk.

She had laboured under the disease six days when I saw her; its course had been obscure and insidious, and its apparent symptoms did not correspond with the actual danger. The most remarkable circumstance was the conviction which she had from the beginning to the end of her illness, that it would terminate in death. (It must be observed, that the apprehension that she should die, in her confinement, commenced at her departure from Martinique, and never left her previous to that event.)

On the morning of my seeing her, this consciousness of dying was at its height, and, with too much reason, for she was nearly in *articulo mortis:* she died in the evening, almost in full possession of her mental faculties; the countenance was hypocratic, the chest

sounded but little on the right side and behind, on percussion.

During her illness she sometimes complained of the region of the heart, to which she pointed with her hand, and where she thought she felt a large projecting tumour. There was nothing visible. She had pain successively in the right and left hypochondrium ; the *jactitation* was extreme, her pulse irregular and depressed ; she died at the end of six days, without having had any very distinct signs of phlegmasia.

Bleeding, leeches, emetics blisters to the legs and to the painful sides, sinapisms to the feet, anodynes, diluents; finally, cordials were employed in vain ; nothing appeared to stop the progress of the disease for a single moment.

By reflecting on the the extent of the pain, on its direction, and on the whole of the symptoms, I think, the diagnostic of the disease may be satisfactorily fixed. Its rapid course even adds to this facility.

On opening the body, marks of pleuro-pneumonia were evident, particularly on the right side, as also of inflammation of the pericardium in its free portion, as well as in that which adhered to the heart; a sero-purulent fluid was found in its cavity, and a thick lymphatic crust was spread all over its surface.

Case 3.—M. de ——— aged about 66 years, a Creole, from Martinique, of a dry and worn out constitution, a naval officer in his youth, and much given at that age to venereal indulgences, had been long subject to violent attacks of the gout, which occurred frequently,

and were more and more protracted. The last which he had in Martinique, in 1804, lasted three months.

This patient came to Paris in the year 1805. (He had not for a long time before quitted the colony.) He experienced in the winter of this year an irregular gout, sometimes in the chest, sometimes in the head and stomach, but principally in the extremities, and chiefly in the knees and feet. He was almost entirely confined to his bed for more than two months. His convalescence was slow, and never appeared to be complete; his strength, at best not great, was never fully restored even to its feeble state. He went one Sunday to Court, where he remained standing for many hours, which rather fatigued him. In the beginning of the week he was attacked with a species of *anomalous* fever, accompanied by great prostration of strength; his head was a little affected, and a pain took place towards the right hypochondrium, which was very tender to the touch; the respiration was tolerably good and without cough.

When I saw this patient, two days before his death, his features were singularly altered, and his head was much confused, although he knew persons. The pain about the hypochondrium continued, and he flinched when it was touched. His pulse was feeble, but not very irregular. One of the most remarkable symptoms was that extreme restlessness, which will not allow those who experience it to remain in the same position for a single moment; a symptom which it would be tedious fully to describe, but of which the word, *jactitatio*, conveys a good idea; incessantly would he sit upright, and immediately lie down, only to rise up again. To-

wards the close of his life, an incomplete paralysis of the left arm took place. At length the head became more and more affected, the breathing suspirious and interrupted, the pulse vacillating and irregular, and the patient sunk, after an agony of some hours, notwithstanding the application of blisters to the legs and painful side, sinapisms to the feet, and the administration of composing and cordial remedies.

I looked upon this disease as a gouty metastasis, scattered on the brain, the chest and the heart, and necessarily mortal in a worn out constitution.

I much expected, on opening the body, at which I assisted, that we should find effusion on the right hemisphere of the brain; the state of the head, and the paralysis of the left arm, sufficiently indicated it: in fact, the circumvolutions of this hemisphere were flattened; the effusion was considerable between the arachnoides and pia mater, and there was also a quantity of water in the right ventricle.

The right lung was in a state of marked inflammation towards its inferior lobe, which was hardish, choked, red, and covered, as well as the adjacent pleura, with the usual pseudo-membranous substance, there was a flaky and sero-purulent effusion in the cavity of this side. It was doubtless this state which had caused the pain in the right hypochondrium.

On opening the pericardium, the same kind of flaky fluid was found in considerable quantity, and all its surface, as well, of that portion which is loose, as of that which adheres to the heart, was covered with the same plaster-like substance.

It is to this particular affection that I ascribe the extreme anxiety, the perpetual *jactitatio,* the suspirious and interrupted breathing, &c. which existed during the latter period of the disease.

This, then, is a case of tolerably acute pericarditis, but complicated with pneumonia and a particular state of the brain.

The age of the patient, his long debility, his bilious habit, his pale complexion, his frequent asthenic gout, in fine, all the marks of deficient vital energy, whether general or particular, do not warrant us, perhaps, in placing this disease in the class of highly active inflammations.

To convince those who may doubt of the great degree of vital debility in this patient, I need only observe, that we discovered, without seeking for it, a considerable quantity of purulent fluid in the joint of the right knee, although the patient had not complained for a long time of this part, had gone out without limping, had stood upright for many hours, and never spoke of this affection during his last illness. These two cases warrant the opinion, that the variable and different temperatures of the atmosphere of this climate, much expose Creoles to acute diseases of the lungs, of the pleura, and also of the pericardium.

There is a variety of acute pericarditis, whose diagnosis is less obscure, whose course is less rapid, and which differs from it in some symptoms, while it resembles it in many others.

I do not think it necessary to devote a distinct section to the history of this variety; I will, nevertheless, hazard naming it *sub-acute peri-*

carditis, not with a view of introducing a new word into medical language, or rather of again bringing forward one which has been too hastily banished by some writers, although it had been so used by others; but with a view of preventing, in the minds of my readers, that confusion which the distinction of these two varieties might produce, if we gave to them names differing otherwise than in the shade of their meaning.

I have described the first of these inflammations as commencing with the most alarming symptoms, as moving on with rapid strides, and dragging, in a few days, the patient to his grave; in the second, we shall perceive a true inflammation, running through its different stages, and having the usual termination of this species of diseases, preserving, it is true, many of the symptoms common to other acute diseases of the chest, but still discovering itself, for the most part, by its own particular and diagnostic characters.

The commencement of that variety of pericarditis, which I call *sub-acute*, is rarely attended with those violent symptoms which threaten a speedy and fatal termination. When it commences, it usually assumes the appearance of one of those inflammatory affections, which, although dangerous, do not often terminate fatally. It is not until it has existed some time that the practitioner can form a sure prognosis; because, till then, he has not had the opportunity of viewing that succession of symptoms which leave no doubt as to the seat or termination of the disease.

Pleurisy is that variety of the phlegmasiæ to which, in its onset, sub-acute pericarditis has the

greatest resemblance. As, in this affection, the patient at first experiences a sense of general heat throughout the affected side of the chest; soon after, that heat concentrates itself about the region of the heart, and an acute and burning pain takes place there. The breathing soon becomes high and difficult, the pulse frequent and hard, but rarely irregular; the two cheek bones, particularly the left, assume a deep red colour; such are the symptoms of its attack: but about the third or fourth day, the peculiar change of the features, the hollow countenance, in which is seen a deep dejection, accompanied however with a kind of irritability; the constant and inexpressible anxiety; the continual agitation; the respiration high, laborious, and interrupted; slight palpitations; incomplete faintings, frequent, or not, according to the rapid or slow progress of the disease; finally, the pulse small, quick, hard, contracted, concentrated, and often irregular; leave but little doubt as to the true seat of the inflammation. These last characters of the pulse are nearly the reverse of what some authors say of it in similar cases. This difference is, doubtless, owing to the pulse having been described in different periods of the disease. Certainly, during the three or four first days of the complaint, the pulse, although hard, is sufficiently free and regular; but when the signs which unequivocally point out the disease appear, the pulse becomes small, quick, hard, contracted, frequent, concentrated and irregular; it preserves this state during nearly the whole course of the complaint; and it is only when the progress of the disease has sunk the patient into a great degree of debility that it

becomes small, soft, intermittent, very irregular, and hardly to be felt.

The more dangerous symptoms which about the third day supersede the primary ones, remain the same but for a short time; after which, the features alter still more, and the face assumes that appearance which has been so well described by Hippocrates, and which custom has so improperly named *hippocratic*; the pain ceases entirely, or partially; fugitive cold shiverings, long and imperfect faintings, a sense of suffocation, and an insupportable anxiety occur; a general œdema comes on; and the patient at last dies, for the most part, suddenly, either in endeavouring to rise, or in drinking, or in changing his position.

Shocks or blows sometimes also, as I have before said, occasion pericarditis. I will give an instance of sub-acute pericarditis, arising from this cause.

Case 4.---On the 9th of January, 1799, a man, aged 40 years, received a blow by the fist on the region of the heart. On the 25th of the same month, violent febrile symptoms, accompanied by oppression and pain under the left part of the sternum, suddenly took place: during the three first days these symptoms increased so much, that on the 30th he made up his mind to become a patient in the Clinical Ward of the Hospital; the best marked inflammatory symptoms had then disappeared without any visible advantage: he complained only of a slight pain in the head, and a continual and indescribable anxiety, which left him not a moment's ease; the skin was dry and hot, the pulse small, fre-

quent, unequal, intermittent, and irregular; the eyes were sunk; the features much changed; the left cheek was very red; the mouth tolerably clean. The sound, by percussion, was very obscure throughout the left side. The breathing, apparently easy, was, nevertheless, on close observation, short, frequent, and a little interrupted; the cough dry and not painful; the patient, notwithstanding, complained of a pain which extended from the posterior part of the sternum to the left side, and to the lower part of the right side of the chest; there were momentary sinkings, which did not amount to fainting. The stools were few, the urine was turbid and deposited a sediment. On the first day I ordered one bleeding; but I did not persevere in this plan, on account of the advanced stage of the disease. From the 30th of January, it was evident that the disease made a rapid progress; the countenance became more and more *hippocratic*; the patient had not a moment's quiet; the breathing was continually interrupted and very difficult; the pulse vacillating, and scarcely perceptible; the prostration of strength extreme, notwithstanding the use of cordials. He remained in this state for the ten first days he was in the Hospital; the only remarkable phenomenon during that time, was a spontaneous and almost sudden dissolution of the right eye, from a suppuration which took place in it without being preceded or attended by any inflammatory symptoms. After these ten days, the disease appeared still to advance more rapidly. The features became entirely changed, the pulse imperceptible, the debility extreme, even unto fainting. This patient, finally sunk on the

nineteenth day of his admission into the Hospital, and on the twenty-fourth of his disease.

I sought in the cranium the cause of the sudden destruction of the right eye; but the brain, the thalami nervorum opticorum, and the optic nerves themselves were perfectly sound.

The pericardium was so enormously enlarged as to contain near four pints of sero-purulent fluid; its inner surface was throughout covered with a thick crust of albuminous matter, the superficies of which was reticulated and *curdled*; an appearance of which one cannot give a better idea, than by comparing it to the inner surface of the bonnet, or second stomach of a calf, except that, in this case, the depth of this kind of net-work was not so great.

The heart was not altered in size; but the leaf of the pericardium which covers it, was firmer and more than two lines thick. The fleshy fibres were not sensibly altered. The left lung, pushed upwards, was spongy and crepitous; the right lung was sound.

That part of the diaphragm, which unites with the pericardium, was not inflamed.

This dissection presents the appearances of a sub-acute pericarditis, as its progress and duration prove, and it is the only one, without complication, which I can cite. In my opinion, this freedom from complication arose from the exciting cause being external and circumscribed; it therefore did not spread, over neighbouring parts, as is the case when it arises from internal causes, which produce an analogous pathological disposition in all the parts surrounding the seat of this disease. When this patient came to the hospital, the inflammation had in a

great degree subsided, and the suppuration and effusion were begun. There is reason to believe that had antiphlogistic means been actively employed in the beginning, they might have moderated, and, perhaps, subdued the inflammation. But the disease had made its appearance in a violent and sudden manner, and when the patient came to the hospital, having already existed five days, the few curative means which were left, rendered the prognosis very unfavourable; mild pericarditis does not always advance with such rapidity. The mildness of its attack, and the frequent slowness of its progress, often afford opportunity, even in an advanced stage, of successfully employing those means which could not be used in the last case, because, as most frequently happens in hospitals, particularly in inflammatory diseases, the patient did not apply for relief until the moment for acting, with any chance of success, was gone by.

Although in this last case the inflammation had, in five days, hurried through several stages, we must not conclude that this is the period after which no efficacious means can be employed for its resolution; here is a proof to the contrary.

Case 5.—A woman, aged 33 years, after three days of great exertion, suddenly felt a pain in her head, a violent cold shivering, and an extremely acute pain, at first occupying the region of the heart, but soon extending to the whole of the left side of the chest. The fever, at first, slight, soon became very violent; delirium came on, with a frequent and painful

cough without expectoration, a peculiar oppression in the breathing, and an insupportable anxiety; on the third day of the complaint, the menses appeared, it being their proper time, but they were less abundant than in health, yet in sufficient quantity, nearly to remove the most alarming symptoms; the patient had, up to that time, resisted the progress of the disease only by drinking plentifully of weak drinks.

The menstrual discharge, which in health lasted nine or ten days, in this instance ceased in three; the disease almost immediately resumed its first intensity. Then came on weak and frequent palpitations, faintings on the slightest motion; this alarming state lasted four days; on the tenth day, the symptoms subsided a little, but no one totally disappeared.

It was at this period that the patient was received into the Clinical Ward. The pulse was small, contracted, frequent, and tolerably regular; the body was not much fallen away; the face was pale, the nose sharp, the cheeks were red, the features contracted, the eyes sunk, the tongue was foul, the pain in the head slight, the breathing high and frequent, the cough dry and continual; on percussion, the left side of the chest did not sound well; it was generally painful, particularly towards the region of the heart, and, above all, on pressing the epigastrium, from below, upwards. The patient preferred lying on the left side; the faintings came on the moment she attempted to recline on the right, or when she was about to fall asleep. She could not remain five minutes together without changing her position: all

the symptoms became exasperated about midnight.

During the two first days of her residence in the hospital, she was in a tolerably quiet state, and had nothing ordered for her but soothing drinks. On the fourth from her entrance, and the fourteenth of her disease, some considerably inflammatory symptoms appearing, twelve leeches were applied to the left side of the chest. The oppression was but momentarily diminished by them, and, in a few days, recourse was had to a first bleeding, which produced sensible relief; a second, on the same day, had a still more marked good effect; the patient became daily better, and, finally, the tongue and the mouth being foul, she took a purgative, and was enabled to quit the Hospital on the twenty-third day from her entrance, and on the thirty-third of her disease.

I have not hesitated to view this disease as a case of sub-acute pericarditis, the symptoms being sufficiently numerous and precise to prevent mistake on this head; I also satisfied myself by percussion, that the other organs, in the left cavity of the chest, were likewise affected. This complication was, moreover, indicated by the general pain on the left side of the thorax. If the menstrual discharge which occurred, on the third day of the disease, had not produced a salutary sanguineous depletion, the patient, who was not confided to my care till the 11th, would, on her entrance into the hospital, have been in such an advanced state of inflammation, that it must have followed the same course as in the former case, and, in all probability, its termination would have been equally fatal.

In appreciating the curative efforts of nature, in this case, whether simply by the process of menstruation, or by the consequent, though incomplete sanguineous evacuation, we cannot but admit that medicine did still more for the patient, when the symptoms resuming their first violence, leeches, and two close bleedings, the propriety of which was indicated both by the advantage derived from the menstrual discharge and by the nature of the complaint, gave such a direction to the disease, that the patient became in a few days convalescent, by the resolution of the inflammation.

Now, the two bleedings which produced this happy resolution, were performed about the 16th or 17th day of the disease, the inflammatory state of which had been rendered stationary by the diversion of the vital movements, through the medium of the menstrual evacuation.

It was not till the 10th or 11th day after this discharge, that the leeches, and particularly the two bleedings, were employed, which produced the resolution of the inflammation: an incontestible proof that inflammatory diseases may, sometimes, attack with violence, suspend their progress, resume their intensity, and that the antiphlogistic plan, and particularly bleedings, may still be proper, and preserve their utility far beyond the period to which authors, more able in theory than practice, have limited their use.

SECOND.

ON CHRONIC PERICARDITIS.

We are far from possessing a correct knowledge of chronic inflammations, particularly of those of the viscera of the chest, and, above all, of that of the pericardium. The history of chronic pericarditis is extremely obscure. This obscurity arises, mostly from its frequent complications, either with a disease of the heart itself, or with chronic inflammation of a neighbouring organ; or, moreover, with hydro-pericardium, or hydro-thorax, or some other affection, to the developement of which it has generally contributed, if it has not even produced it.

An insurmountable difficulty in the diagnosis of this inflammation, arises, in many cases, from its various complications, from its often imperceptible commencement, and from its obscure progress. If we examine the few cases which have been published in this department of practice, we shall be at a loss to know, by what signs to ascertain its commencement, what symptoms attend its course, and shall be obliged to admit, that all the phenomena described as belonging to this disease, are so vague, that it is even doubtful whether the union of a number of cases of this complaint, would throw much light upon its history. Let us endeavour to prove this by the following fact.

Case 6.—A Potter, aged 62 years, had been subject, from his infancy, to an habitual

difficulty of breathing, which encreased with his age. He was exposed, by his trade, to the greatest vicissitudes of heat and cold, at one moment kneading the earth, at the next supplying the furnace with fuel. In the month of April, 1801, this man had very sharp rheumatic pains in his loins, principally towards the left side, which sensibly increased his habitual dyspnœa. Forced to keep his bed by the continuance of his pains, he was brought to the Hospital of *la Charité*, where he remained for a month without obtaining any relief.

On returning to his employment, his pains became rather less; but in the beginning of July of the same year, his legs began to swell, and a convulsive cough came on, which gave him great pain in the chest. These symptoms disappeared for awhile, only to return with greater violence. A general effusion having taken place, this patient was again admitted into the Hospital, on the 9th of October. At this time his countenance was bloated, but the general œdema not very great; the chest sounded well on every side; the breathing was short, embarrassed and frequent, and attended by a sense of weight about the xiphoid appendix. Much variation was perceptible in the motions of the heart and pulse; sometimes the motions of the heart were equable and regular; at others, there was felt an obscure trembling, a kind of rustling. The pulse always quick, was, by turns, equal and regular; unequal, irregular, and very intermittent; there were no palpitations: the sleep was sufficiently long, although often interrupted by dreams; the patient lay with difficulty on the left side, but preferred lying on his back.

He remained nearly in this state until the 23d. On the morning of that day he did not appear in a more alarming state than usual; he, nevertheless, died in the evening, after having suffered great agony.

At the time of opening the body, the lips were violet; the face pale; the chest sounded well in all its regions, except near that of the heart, where the sound was rather obtuse. At this spot the two lobes of the lungs adhered to the pleura. The lungs on each side, although crepitous, were granulated throughout. The size of the heart was not increased.

The pericardium contained a small quantity of turbid fluid. This membrane had increased in thickness; its inner surface was not smooth and even, as in a natural state; the portion which covers the heart was of a greyish colour, thickened, unequal, wrinkled, horny, and had granulations, the summits of which appeared ulcerated.

The two auricles were shrunk. Some small hard tubercles were found in the thick part of the mitral valve. The tricuspid valves were a little thickened, and nearly as hard as cartilage.

The fifth dorsal vertebra, and the head of one of the corresponding ribs, were beginning to be carious.

A rational analysis of this dissection, displays, in a satisfactory manner, chronic pericarditis, and its numerous complications. The thickening of the pericardium, and its other changes, as well as the turbid fluid found in its cavity, sufficiently indicate, I think, the chronic inflammation of this membranous bag: the fugitive rustlings which were felt about the

region of the heart, added to the irregularity and inequality of the pulse, and to the convulsive cough, evince a first complication, arising from hardened tubercles of the mitral valve, and from the thickening and almost cartilaginous consistence of the tricuspid valves.

Another serious complication arises from the numerous granulations scattered about the substance of the lungs, and found even on the heart, &c. It is to this disposition, of long standing, without doubt (with the nature and formation of which I am totally unacquainted,) and which I consider as the effect of an acrimonious humour *sui generis*, that I attribute the old habitual dyspnœa, which was, in the end, increased by the affection of the pericardium and heart. May not the caries also be imputed to the same cause?

Finally, the business of the patient, which incessantly exposed him to frequent, sudden, and great changes of temperature, sufficiently account for the rheumatic pains in the chest and in the loins; and is not all this more than sufficient to have hastened the progress of the disease, to have caused the dropsical effusion, &c.?

I have often seen this disease, but have always found its diagnosis difficult, and sometimes very obscure; I am, therefore, not at all surprized at the uncertainty which is felt after reading the cases which have been published of it. After perusing them with the greatest attention, even after deeply meditating upon them, we must often have recourse to the opening of the dead body to be able to ascertain the true seat of the disease. I am therefore perfectly satisfied, that

it will generally be very difficult to recognize this affection by the bedside of the patient, on account of the almost constant complications which accompany it. I am even much disposed to consider this disease as generally consecutive, and particularly so in the subject of this case.

I have pointed out, in the preceding articles, as clearly as I could, all the signs and symptoms, which I thought could be allowed, of the different species of pericarditis. I have asserted, from my own experience, that if it is possible for the prognostic ever to be favourable, it can only be so in the sub-acute pericarditis, and not in those which I have called acute or chronic; that these, on the contrary, lead to a rapid or slow, but almost always certain death.

As to the treatment, these inflammations require the means usually employed in the different phlegmasiæ, whether acute or chronic, of the chest, always remembering that the anti-phlogistic treatment, and particularly local and general bleeding, should be employed with more freedom and promptitude, in the first stage, than in the second, and in this than in the third; and that when these means have been employed, we must rely chiefly on revulsive remedies. The best, according to my experience, and which I am not the first to recommend in pericarditis, as well as in pleuritis, &c. are large blisters applied to the painful parts, even where the pain itself may be confined within a narrow compass. I cannot too much recommend this method, after the advantage I have almost constantly seen result from it.

Section II.

OF ADHESION OF THE PERICARDIUM TO THE HEART.

The examination of the different degrees of inflammation of the pericardium has taught us, that when patients sink under this disease, the traces of organic change are as variable as those degrees themselves; thus on the termination of the highest degree of acute pericarditis, a small quantity of fluid, not thick, but turbid and reddish, is found in the cavity of the pericardium, the inner surface of which membrane is red, livid, and marbled.

When patients have sunk under pericarditis, the progress of which has not been so rapid, or even under chronic pericarditis, the inner surface of the pericardium, and the outer surface of that fold of it which adheres to the heart, are covered with a membranous kind of exudation, which I have sometimes seen more than six lines in thickness. If we remove this lymphatic crust, which generally yields with facility, we find the membranous surface inflamed, sometimes uneven, of a pale red, and as if it were blanched by the substance which covered it. Between these two pulpy layers, one of which covers the outside of the membrane of the heart, and the other the inside of the loose pericardium, we often find lodged a greater or less quantity of a purulent-like fluid; but it is also not uncommon to observe, at the end of inflammations, whose progress has not been rapid, the free and the fixed portions of the pericardium united

together by means of these two pulpy layers glued to each other, and which it is sometimes possible to separate by pulling the parts in opposite directions; then each of these lymphatic layers will adhere to that portion of the pericardium by which it had been thrown out. In other cases, they cannot be disunited; the difficulty appearing to depend upon the length of time the exudation has existed.

In short, whatever may be the exciting cause of adhesion of the pericardium to the heart, the concurrence of a great number of facts teaches us that this adhesion may take place in three different ways. 1st, From the interposition of the lymphatic exudation which has been thrown out by the previously inflamed membrane, and of this we have just been speaking. 2d, Where this adhesion is intimate and immediate, complete or partial, as it sometimes is; it would seem that there is no uniting medium. I am disposed to consider rheumatic and gouty affections as a frequent cause, among others, of this adhesion. 3d, It is sometimes owing to numerous cellular filaments, the length of which varies from seven or eight lines to the smallest possible. These two kinds of adhesion probably begin at an early period. The cause of this last is unknown.

The adhesion of the pericardium to the heart, in this last case, and sometimes in the second, does not constitute a real disease; it merely puts the patient into a state of supportable inconvenience; that is to say, when the adhesion is partial and formed by cellular filaments, more or less long, or even when it is immediate but partial, and not extensive, the function of

the heart is not sensibly injured by it. It resembles, in this respect, those frequent adhesions of the lungs to the pleura, which are found in the bodies of persons who had no complaint of the chest during life, and who fell the victims of any disease rather than an affection of the pulmonary organs, the existence of which had not even been suspected.

But as I think it is not possible to live, and to live in health, with a perfect and close adhesion of the lungs to the surrounding parts, so I think that a complete adhesion of the pericardium to the heart will necessarily be attended with such a derangement in the functions of that organ, that death must inevitably ensue, sooner or later, according to age, sex, temperament, profession, moral dispositions, &c. Here is an instance in point:

Case 7.---A man, 40 years of age, felt a very violent pain in the epigastric region. This pain was accompanied by weak but frequent palpitations, and great difficulty in breathing. The pulse was small, quick, and irregular; and on applying the hand to the region of the heart, it appeared to beat with irregularity. From time to time, the pain, the difficulty of breathing, the palpitations, and indeed all the symptoms, were greatly aggravated. In one of these paroxysms, which occurred after short intervals, an ecchymosis took place about the eye-lids of the right eye, the ball of which became inflamed.

Although the number and severity of these symptoms gave great reason to fear for the life

of the patient, he was, nevertheless, enabled by the antiphlogistic treatment, and the use of emollients and antispasmodics, to resume his usual occupations. He continued in health for forty days, when he became a patient in the Clinical Ward. To the symptoms before described, were now added ascites, and frequent paroxysms of fever. The quantity of water was so great as to render tapping necessary, but this was employed only as a palliative; in effect, the water again collected; the patient complained of continual pains in various parts of the belly, but principally at the bottom of the right iliac region. The pulse was constantly very weak, the sleep trifling, and the left side of the chest did not sound on percussion. The strength diminished daily, notwithstanding the use of cordials. In fine, eight months after the first illness which I have mentioned, the patient passed quietly from life to death, a few minutes after he had gone to bed, where he was thought to be sleeping.

In the course of this person's first complaint, I had announced the existence of an organic Lesion of the heart. My diognostic became more precise long before his death, and I thought I could pronounce that there was an adhesion of the pericardium to that viscus. On opening the body I found a considerable quantity of water in the left cavity of the chest; the pericardium adhered externally to the lungs, and internally to the heart, its adhesion to which was so strong, that they could not be separated without a most careful dissection. The blood was accumulated in the right cavities of the heart and in the venæ cavæ, so as to distend

them to an extraordinary size; the other parts of this organ were in a natural state. The blood, in all these cavities, had a remarkable fluidity. The muscular fibres of the heart were generally very pale, and their action must have been reduced to almost nothing for some time before death, which, perhaps, may have been the immediate cause of that event. The left lung, pushed up towards the superior part of the chest, was hardened; the right was in a tolerably good state.

The cavity of the abdomen contained a good deal of bloody serum; the alimentary canal was contracted, and altered externally; almost the whole of the peritoneum was covered with granulations.

The symptoms, already detailed, are not the only ones which have been observed in persons in whom the pericardium adhered to the heart. Those of which I have to speak are, in general, very varied; but in the greater number of cases, sudden flushings of the countenance come on, which are produced, probably, by the adhesion impeding the regular action of the heart, according to the different motions of the body, and independent of moral causes, which also frequently occasion these sudden changes of the countenance. The patient experiences likewise a painful sensation of pulling in the region of the heart, because, in the act of breathing, the diaphragm in its descent drags downwards the pericardium and the heart which adheres to it, opposing, at the same time, the particular rising motion of that organ during its contractions. The breathing is high, frequent, and oppressed upon the slightest motion; faintings come on;

the pulse is more or less irregular, particularly during any movement of the body.

These symptoms would be still more decidedly marked, if the under surface of the diaphragm should have contracted adhesions with any bulky tumour, situated in the abdomen, or with any viscus, as the liver, for example, which may have attained a considerable weight. These different circumstances, by confining the diaphragm downwards, would thereby present a permanent and insurmountable obstacle to the free action of the heart.

The absence of strong palpitations appears to me a circumstance well calculated, if not to characterize the disease, at any rate to assist us in distinguishing it from other affections of the heart, in which they almost always exist. Palpitations may be considered as disordered, unusual, and more or less violent and tumultuous movements of the heart; now how can this organ, when closely connected with the diaphragm by its membranous covering, perform these extended motions, all change of position being nearly prevented by these adhesions? The contractions of the heart are, in this case, quick and disordered, but dull and deep, weak, obscure, and imperfect. Notwithstanding what I have said, I readily confess that the diagnosis of the adhesion of the pericardium to the heart, even where it is a simple adhesion, is extremely difficult to establish upon sure grounds. I will moreover add, that when it is combined with some other affection of the heart or chest, the always more prominent symptoms of the affection with which it is complicated, prevent us from recognizing, nay, oftentimes even from suspecting this adhesion. Here is a proof,

Case 8.—A young woman, who was very regular, from the age of 18 to that of 23 years and a half, caught a cold at that time, which she much neglected for five months; when that period had elapsed, she felt a violent pain in a part of the left side of the chest. The respiration was already short, and troubled; she had begun to lose her voice, had a dry and frequent cough, slight fever by night, perspiration on the chest, heat and dryness in the palms of the hands, and on the soles of the feet. Such was her state, as it appeared to me, on the 20th of June, 1799, the day of her admission into the Clinical Ward. She found little relief from the means employed during her stay in the Hospital. The cough, and loss of voice were diminished; but the breathing became more difficult, shorter, more hurried, sometimes sibilant, and with a heaving up of the shoulders. She experienced constantly, during the night, stiflings, long and continued fits of violent coughing, and a sensation of extreme constriction upon the chest; the fever had ceased to be perceptible. The complaint making fresh progress, the cheeks became violet, and streaked; the lips of a deep red; the rest of the countenance was pale; the eye-lids were wan and yellowish; the chest was no longer painful; it did not sound on the left side, when struck; the pulse was small, very frequent, but without any marked irregularity; the arms and legs were not œdematous; there was no appetite; she could not lie down on the right side. Being satisfied that there existed an effusion on the left side of the chest, medicine appeared to me likely to afford very little relief. Convinced

that the operation for empyema, in similar cases, was more than doubtful, I had some difficulty in making up my mind to perform it; however, the stiflings having still increased, and fearing they might produce suffocation, I opened the chest on the 12th of October following; a considerable quantity of fluid was immediately evacuated, which had all the physical and chymical characters of the serum of the blood. During the day, a fresh quantity came away, but the breathing still continued equally difficult.

The 13th.—No sleep, the breathing a little freer, the belly less swollen, the countenance the same; the day passed calmly; there was fever at night.

The 14th.—The serous fluid still flowed abundantly from the wound; it smelt strong and disagreeable; injections of equal parts of decoction of barley and bark were used. The chest, when struck, sounded well on both sides; the pulse was frequent and feeble.

The 15th.—The night was tolerably good; during the day, the cough was more troublesome; the discharge from the wound was so great as to lead to the idea that the effusion still went on; the pulse, though frequent, was rather stronger than the day before.

The 16th, 17th, and 18th.—The symptoms became more and more alarming; the pain in the left side returned; some irregularity was perceptible in the pulse; and she died on the 19th.

On opening the body, the lips of the wound had a gangrenous appearance; there was a little water in the right side of the chest; the lung on that side was sound; the inner surface of the

left cavity was sprinkled with granulations; the lung of this side was small, hard, schirrous-like, and lay flattened against the mediastinum; the pericardium, thickened and whitish, was very closely united to the heart, so that it was not possible to separate the slightest portion of them, without using a cutting instrument; the heart, the substance of which appeared discoloured, was, with its covering, pushed up towards the right and upper part of the chest.

Although I am induced, from the history of this disease, to believe that the adhesion of the pericardium to the heart was consequent to the chronic cough, the effusion, &c. I have cited this case rather than any other, because, while it presents an intimate and total adhesion of the pericardium with the heart, which was not perceptible from the general symptoms, it gives me an opportunity of remarking, that having often practised the operation of empyema in analogous cases, I think I have clearly ascertained, that it rarely procures even a transient relief, but, in all these cases, accelerates the death of the patient.

After the simple display of symptoms caused by the total adhesion of the pericardium to the heart, and after what I have above said, ought we not to conclude, that the situation of persons so affected would be always more or less painful to support, and would eventually lead to their dissolution? Nevertheless, there have been subjects which, after death, have been found in this pathological state, that while living had not the slightest symptoms of such an affection. It would appear, then, that in time, the heart, occasionally, accustoms itself to

the impediments which this disease, when it has been gradual and slow in its formation, presents to its motions.

On the other hand, it has been imagined, that the habitual oppression, and the continual anxiety likely to proceed from it, might put the patient, although enjoying in appearance tolerably good health, into such a state of languor and melancholy, that life itself should become insupportable. In proof of this opinion many cases have been recorded, to which I will add the only one I have witnessed.

Case 9.—An apothecary's assistant carried for many years in his countenance the marks of deep dejection. He had always been subject to shortness of breath, particularly on walking quicker than usual. Without any known cause, he endeavoured to poison himself with opium; not succeeding, he continued equally melancholy for several months, when he took a fresh dose of the same poison, which killed him in a few days, after having given rise to genuine peripneumonic symptoms. It was afterwards discovered that he had contracted a trifling debt which he could not pay: I know not whether this single circumstance could have driven him to the act of despair which terminated his existence.

On opening the body, the pericardium was found to have formed adhesions for the space of about two inches in diameter, round the apex of the heart, and which appeared of long standing. The marks were also evident of the recent peripneumonia, which had produced effusion in the chest and death; for I do not think that the ad-

hesion of the pericardium, which was only partial, can be considered as the cause of that event; but I certainly regard it as the cause of the old habitual difficulty in breathing, &c.

It would be absurd to conclude, from this case, and from those which have been before published, that all suicides have an adhesion of the pericardium to the heart, as I have frequently met with these adhesions, in all their degrees, in individuals, who had never been subject to that melancholy which leads to self-destruction. It is with these adhesions, as with biliary calculi, which, it is said, have been frequently found in those persons who have made attempts upon their lives. Are the uneasiness, the anxiety, and the agony caused in some instances by adhesion of the pericardium to the heart, capable of rendering life insupportable? Nothing, in any of the cases above alluded to, appears to me to prove it.

These total and close adhesions of the pericardium to the heart are often accompanied by an aneurism, or a considerable enlargement of that viscus, and with little or no effusion in the cavities of the chest. When effusion does exist, it is found indifferently in either of these cavities.

Youth is not exempt from this disease: I have seen the immediate and complete adhesion of the pericardium to the heart, in a young man of 18. The size of this organ was at least equal to that of a large beef's heart. I have seen it this year, (1810,) in a girl aged 13, who had never menstruated. The heart was double its natural size. The pains which she felt in it for a month before her death were extreme. I do not doubt, that the same fact has been observed in many young subjects.

Section III.

OF THE WHITE SPOTS WHICH ARE FOUND ON THE SURFACE OF THE HEART.

In a considerable number of dead bodies white spots are found upon the surface of the heart, the size of which varies from that of a lentil to that of a crown piece, and sometimes they are even larger. The formation of these white spots has been attributed to the impression of the parietes of the chest upon the heart, when its contraction impels it against the ribs: this explanation does not appear to me admissible; because the spots, according to this theory, ought always to be found on the fore part of this organ, whereas they are as frequently observed on its posterior surface, on its sides, and where it faces the diaphragm.

To what cause, then, can be attributed this peculiar state of the heart? Ought it even to be considered as pathological? And in this case, has it symptoms by which it may be known? In fine, what kind of derangement of function results from one or many of these spots? Does even any result? I think these questions may be answered in the negative.

These white spots, which, at first sight, appear to owe their opacity to an opaque state of the portion of the pericardium which adheres to the heart, turn out, on a more accurate examination, not to be actual changes, but only the consequence of an old affection of this membranous leaf. For if we lift up one of these white spots, (which cannot be done without

detaching the pericardium itself) it appears to consist of a layer of lymphatic matter, adhering to the inner surface of that leaf of the pericardium which is connected with the heart. By scraping it off, the membrane to which it adheres, will be found not to have lost any of its transparency, and not to be sensibly changed in its texture. This white matter appears to be an exudation similar to that which usually takes place in the inflammation of serous membranes: but here it is inside, instead of outside the membrane.

Is it reasonable to consider these spots as the effects of local inflammation, slight and ancient, of the membrane which covers the heart, and which having thrown out this lymphatic exudation, and it not having afterwards been removed by the absorbents, these white appearances remained? I feel great difficulty in adopting this explanation. I will observe on this head, that similar spots are often visible on viscera, covered by the same kind of membrane; on the surface of the liver, of the intestines, of the lungs, and particularly on the arachnoides; indeed, considering the frequency of this organic appearance, how can we suppose that the symptoms usual to inflammation of these parts, could be so vague as not to induce us to suspect, at the time, according to this hypothesis, the nature of the affection?

I forbear to quote cases of this kind, because they are so common, that every practitioner who has been at all in the habit of examining the dead subject, must have met with them.

Besides, I maintain that their size and situ-

ation, under certain circumstances, render more than doubtful this explanation by inflammation; and that it is difficult, in some of these cases, to persuade oneself that the presumed inflammation, must not have produced some very serious symptoms, rather than symptoms so slight, that the patients themselves had no recollection of them. Is it even right to use the word inflammation, merely to give plausibility to an explanation of this phenomenon, the cause of which appears to me entirely unknown ?.

CHAPTER

CHAPTER THE SECOND.

OF HYDRO-PERICARDIUM.

Dropsy of the pericardium may be considered as one of the consequences of inflammation of this serous membrane; but the collection of turbid, coloured, and purulent fluid, which takes place in the pericardium, from pericarditis, differs in many respects from that limpid and mostly colourless fluid, which owes its existence to a disease of the heart, an inflammation of the mediastinum, of the pleura, of the lungs, or to any other cause, which directly, or indirectly, destroys the proper equilibrium between the action of the exhalants and that of the absorbents of this membrane. It is this serous, limpid, and almost colourless effusion, which particularly constitutes hydro-pericardium.

The pericardium, like all other membranes of a similar texture, continually moistened by an aqua-serous fluid, furnished by the exhalants and taken up by the absorbents, becomes, when the exhalation is too great, or the absorption too little, the seat of a peculiar dropsy. The quantity of water collected would be small, were not the pericardium susceptible of considerable distention.

On opening bodies, whatever disease may have caused death, more or less serum is found in the cavity of the pericardium. This fact is so constant, that many authors have remarked, as extraordinary cases, those in which the internal surface of the pericardium was dry.

The quantity of fluid, it is said, depends upon the length of time the individual may have been dead. This can only be true to a certain extent. It would be more correct to say, that the constitution of the person, the nature, the duration of his disease, perhaps, even its treatment, much influenced the difference of quantity. Thus I have seen bodies opened, a short time after death, in which the pericardium was found to contain a considerable quantity of water, while, on examining others, which had been much longer dead, very little was found: but we ought not, on this account, to say that, in the first case, there was dropsy. What quantity of collected fluid is necessary to constitute hydropericardium? Opinions on this subject are divided, and ever will be so, from the nature of things; and it appears to me the more difficult to give a precise answer, because authors have treated of this dropsy without having first asked themselves the question which I proposed to myself on this occasion. If observation proves that six ounces is the greatest quantity that has been found in persons dying of those diseases, which cannot lead to dropsy of the pericardium, am I not warranted in concluding that when this fluid exceeds six or seven ounces, a dropsy of this membrane exists?

This quantity, which I boldly consider as morbid when it exceeds in weight six or seven ounces, may become much more considerable. I found in the pericardium of a person who died of aneurism of the aorta, at least two pounds of an aqueous and colourless fluid. Authors speak of effusions still more considerable. I shall describe the case of a patient in whose pericar-

dium were found eight pounds of serum. Rarely shall we find greater effusion than this: for, on the one hand, the extensibility of the pericardium is naturally limited; on the other, when its distention is very considerable, the compression which it produces upon the lungs and the bronchiæ, on the heart, and its large vessels, seldom permits the patient to proceed much longer in his painful career.

The particular causes of dropsy of the pericardium, besides those of dropsies in general, are affections of the heart, of the mediastinum, of the pleura, and of the lungs.

The signs by which we may know dropsy of the pericardium, have long been a subject of discussion, without a certainty of diagnosis having yet been attained. However, here follow the best which my practice has furnished me upon the subject.

Patients afflicted with hydro-pericardium have their countenance of a violet colour; their lips black and livid. They feel a painful anxiety and uncomfortable weight about the region of the heart; a difficulty of breathing, which threatens suffocation, when they assume a horizontal position; they are frequently afflicted with syncope, and sometimes with palpitations. The pulse is small, feeble, frequent, concentrated, and occasionally irregular. On putting the hand upon the region of the heart, obscure and tumultuous pulsations are perceptible; it might be said that these pulsations seem as if felt through a soft substance, or rather a fluid, placed between the heart and the thoracic parietes. On percussion of the chest, whether the patient is sitting or lying, the sound, if any, is

obscure, anteriorly, and on the left side, to an extent proportionate to the dilatation which the fluid has produced in the pericardium. In some cases, the left side of the chest is more rounded and protuberant than the right; when the disease is of long standing, the strength of the patient becomes nearly exhausted; an œdema takes place in the lower extremities, and now and then a slight puffing at the fore part and left side of the chest.

These different symptoms generally exist in simple dropsy of the pericardium, and are for the most part acknowledged; but there are others, which, though rare and noticed but by few practitioners, do not the less deserve attention. Thus I have had occasion to make an observation analogous to that of *Senac*, who saw between the third, fourth and fifth ribs, the fluctuation of the effused fluid in the pericardium. I cannot say that I have actually seen the same phenomenon, but I have convinced myself of its existence by the touch; it is possible that the undulations which my hand, placed upon the region of the heart, distinctly felt, were occasioned simply by the beatings of that organ. I am far from denying it; but can affirm, if it be so, that the peculiar character of these beatings is very distinguishable. It is but justice to say, that I have made this observation but in one case; while we must infer from what *Senac* says, that he saw these undulations in several instances. Finally, I repeat that I have only felt by the touch, what *Senac* says he very distinctly saw.

I will not stay to discuss the various other signs given by some authors, as pathognomonic of hydro-pericardium, and which, according to

Morgagni, are, most of them, undeserving a place in the list of even equivocal signs of this affection. I shall therefore only indicate as such, an enormous weight which the patients feel upon the heart, according to *Lancisi* and several others; the opinion of patients themselves, who say that they feel their heart swimming in a fluid, according to *Reimann*, *Saxonia*, &c.; the livid colour of the lips; and the impossibility of lying on the right side, as before mentioned, without producing a sense of immediate suffocation. This latter sign has been given, by turns, as characteristic of many diseases of the chest, and cannot exclusively belong to one, as it is found in several.

To all these signs, I will add one, which has twice fallen under my observation, and appears to me more deserving of notice than any of the last: I mean the pulsations of the heart, which are sometimes felt on the right, sometimes on the left, or to express myself more clearly, in different points of a tolerably wide circle. How is it possible for these shifting pulsations to exist, if the heart be confined, as it naturally is, in the pericardium, an almost immoveable bag, the cavity of which proportioned to the size of this viscus, fixes the extent and direction of its movements? If these pulsations, then, are to be felt in various and distant points, the pericardium must be dilated; and it can be so but from two causes. 1st, From the increase of the volume of the heart itself; but in this case the enlargement being mutual, the proportions will be the same, and although the force and extent of these pulsations may be greater, according to the enlargement of the

heart, yet they will almost always be felt in nearly the same points of the chest. 2d, From the accumulation of some fluid in the cavity of the pericardium; and it is then that the heart, which has not proportionably increased in size, swims or wanders freely in this fluid, and strikes at points distant from each other, according to the degree of effusion and dilatation. I will cite some cases in support of what I advance.

Case 10.—A man, aged 34 years, convalescent from a severe peripneumony, had still a great difficulty in breathing, accompanied by a dry and frequent cough. Four months afterwards, when he was admitted into the Clinical Ward, he could not lie down, but sat upright, night and day, inclining to the left; if he attempted to place himself on the right side, he was immediately seized with a sense of suffocation. His face was bloated, and of a violet colour; his lips were livid, his legs œdematous, his pulse was quick, very feeble, and irregular; and he had frequently incomplete faintings. The pulsations of the heart could not be felt. The fore and left part of the chest did not sound on percussion. On a view of these symptoms, I pronounced the existence of hydro-pericardium, and its fatal termination. Leeches applied to the anus, and a spontaneous nasal hemorrhage, rendered the breathing more easy; feeble and tumultuous pulsations were then to be felt in the region of the heart. But, in a short time, the symptoms increased, and the patient died in a state of agony difficult to describe.

On opening the body, the pericardium was found much distended, and compressing the sunk

and hardened lung: this membrane had a more than natural thickness; it contained about four (French) pints, or eight pounds, of transparent and greenish fluid. The surface of the heart appeared to have been the seat of chronic inflammation. There was little effusion in the chest.

Case 11.—A Tailor, aged 33 years, of a strong constitution, was admitted into the Hospital towards the close of March, 1800. His complaint had commenced about three or four years before. Long running, to which he was compelled at a time when much frightened, had brought on a dyspnœa, a dry cough, and palpitations, which had gradually become stronger and stronger. These symptoms were excited on the slightest motion of the patient, whose countenance was animated *(animée)* and suffused. The pulsations of the heart were tumultuous, and accompanied by a kind of rustling. All the other functions, particularly those of digestion, were well performed. There was no sign of effusion in the chest or abdomen. Neither was there at first any œdema, but it soon took place in the lower extremities. The patient, finding he did not gain ground, left the Hospital forty days after his entrance; but he soon returned. His countenance was changed, and all the symptoms of an organic disease of the heart, gradually became worse and worse; his sleep was disturbed by frightful dreams, and he often awoke with startings. The urine became diminished, the anasarca increased; it reached the parietes of the abdomen, and even the arms and hands; it was firm, without changing the colour

of the skin. The liver became painful. Hemorrhoids appeared, which occasioned much suffering; and a manifest effusion took place in the cavity of the abdomen.

The remedies used, failed to produce any effect, even as palliatives. The swelling became so considerable and so troublesome, that scarifications were made in the legs; a great quantity of water was discharged, and, as this patient had much vital energy, the skin soon recovered itself. The relief which this evacuation procured, was but of short duration, the scarified parts becoming inflamed and painful, which put an end to the farther draining of the serous fluid. In a short time, the anasarca and ascites became as great as ever, and went on increasing till the end of the disease. In the latter period of the complaint, the pulsations of the heart became weaker, and were felt in different points of the fore part of the thorax, as if the apex of that organ struck sometimes in one place, sometimes in another. This symptom induced me to suspect there might be water in the pericardium, a supposition which was confirmed by the examination of the dead body.

Finally, after remaining seven months in the hospital, the characteristic symptoms of this disease, such as continual anxiety, sense of suffocation, &c. becoming daily more insupportable, the patient expired, after having spat blood during an agony of several hours.

There was general anasarca; the thoracic cavities contained but little water, but the pericardium, which was much distended, and which occupied almost the entire transverse diameter of the thorax, contained more than two pints.

The volume of the heart was much increased, the aperture of the aortic ventricle was contracted, and formed a kind of crooked and irregular slit, which presented some hard and osseous points; the mitral valve was hard, and as if ossified; the aortic valves were thick and curled up; the abdomen contained a great quantity of yellowish serum; the liver was very dense, hard, and much gorged with blood.

It seems scarcely necessary for me to observe, that if all the symptoms which I have given as proper to hydro-pericardium, are not found united in this case, it is because here the effusion was consecutive. The heart was the organ primarily affected, and hence the symptoms of a disease of that viscus are the most evident.

The foregoing enumeration of symptoms belonging to the disease, which is the subject of this chapter, is sufficient to discredit the opinion of some physicians, who have maintained the impossibility of establishing a diagnosis for hydro-pericardium. It must, however, be admitted, that although this disease, when insulated, is not very difficult to recognize, it becomes extremely so, in most cases, from its numerous and frequent complications. In fact, besides dropsy of the chest, which sometimes forms at the same time with it, we frequently find it united with the diseases which excited it, such as affections of the lungs and heart; nevertheless, a well experienced tact will almost always distinguish it.

Before I conclude what belongs to hydro-pericardium, I must not forget to speak of an interesting phenomenon which I have frequently observed. In cases of anasarca, or general

leucophlegmasia; the great quantity of water effused in the cellular membrane of the extremities, as well upper as lower, usually produces an extraordinary enlargement of them; the abdomen also generally contains a great quantity of fluid; but it sometimes happens that the chest escapes this serous diathesis, and preserves its natural state amid the general effusion. When the breathing in this case is difficult, it arises solely from the diaphragm pushing upwards. If, under these circumstances, percussion be employed, this cavity, notwithstanding the puffing of the integuments, gives a sound sufficiently clear to prove that it contains no water. By making the same experiment on the region of the heart, we obtain the same result, so, that from that time, all idea of hydro-thorax or hydro-pericardium, is abandoned; the proper symptoms of which do not, in truth, exist, although from the state of general leucophlegmasia, those complaints may have been suspected.

However, although two days before death, or even the day before, we may be convinced that, in such cases, the chest is free from effusion, we must not expect to find none in the dead subject. We might in this case be grossly deceived, declaring the chest to be perfectly empty, and finding it, contrary to our expectations, containing much water.

I have often remarked, in my lectures, that although a few days before, or even at the moment of death, the extremities may have been swollen or distended with water, yet, fifteen or twenty hours afterwards, this swelling has been found to have greatly, nay, sometimes almost wholly, subsided.

In a very short time, then, notwithstanding the body was inanimate, a kind of revulsion took place, which caused, on the one hand, the almost total disappearance of effusion in the extremities, and on the other, produced a deposit in the chest and pericardium, proportionate to the emptying of the cellular membrane of the extremities. We consequently feel some surprize, on opening the chest, to find, contrary to expectation, more or less water in it, as well as in the pericardium.

Whether hydro-pericardium be simple or united with hydro-thorax, the internal means of treating it are the same as those used for dropsies in general. *Senac* has particularly proposed for hydro-pericardium, the operation of tapping; he has even minutely described the manner of performing it with the trocar. I believe, contrary to the opinion of this author, that the advantage to be derived from this operation will rarely counterbalance the danger which attends it. But if it be decided upon, incision with the bistory is, on various accounts, to be preferred to puncture with the trocar.

Senac does not relate any fact in support of his advice to tap in hydro-pericardium; he simply brings forward a case of hydro-thorax, in which he opened the chest with complete success. But in respect to the danger of the operation, the two diseases have no resemblance.

Desault went further, but still without opening the pericardium. Here follows the interesting account of the operation, as it is reported in his surgical works.

"A man came to the Hospital of *la Cha-*

rité, with all the characteristic signs of a dropsy of the pericardium : dry cough, difficulty of breathing, slow, hard,* and irregular pulse ; pain and anxiety ; danger of suffocation in lying down ; sensible relief in standing upright ; frequent syncopes ; pale and bloated countenance ; manifest swelling in the præcordial region ; an habitual tendency to incline to the left side : such were the symptoms of the patient.

"*Desbois* and *Dumangin*, physicians to the Hospital, *Sue* and *Desault* surgeons, having met in consultation, did not at first agree as to the nature of the disease ; some taking it for an affection of the heart ; others for a dropsy of the chest ; others for a collection of water in the pericardium. All the opinions at length centred in the two last, in which they were equally divided. To reconcile them, *Desault* proposed an operation, which was equally proper in either case ; it was to open the chest between the sixth and seventh ribs of the left side, opposite the apex of the heart, by carefully dividing the skin, the intersection of the external oblique and great pectoral muscles, and the intercostals. This plan was adopted, and executed on the following day.

The incision having been made with the necessary precautions, *Desault* introduced his fingers into the chest, and felt a kind of pouch full of water, which he took for the pericardium. The other practitioners, having also examined the parts, were of the same opinion."

* Slowness and hardness of the pulse are, in my opinion, contrary to its state in hydro-pericardium.

He then opened, with a bistory, the distended pouch, and gave vent to about a pint of water, which escaped, with a kind of whistling, at each expiration. The draining having stopped, and the finger being again introduced, a firm, pointed, and conical body, was felt striking against it. All present felt it, and the general opinion was, that it was the naked heart.

The symptoms became less for the two first days after the operation; but they returned with greater violence on the third; and the patient died on the fourth. On opening the body, a membrane was discovered which united the edge of the left lung to the pericardium, and formed the pouch which had been taken and opened for that membrane. The conical and pointed body, which was supposed to be the bare heart, was, in truth, that organ, but enveloped by the pericardium, to which, for the most part, it adhered. The heart was much more dilated than usual, and was full of black blood, partly coagulated.*

I do not place among the diseases of this class the absolute want of the pericardium, which some anatomists have remarked, because I am convinced that they were deceived, mistaking its complete and intimate adhesion to the heart, for the want of that membrane. This fact, and many others still more extraordinary, which some authors have been at the pains of collecting, are not more deserving of our atten-

* Those who may read this work with attention, will readily believe, that if percussion had been used, and if the signs of aneurism of the heart had been as well known as they now are, this operation, however brilliant, would not, perhaps, have been undertaken.

tion than the account of hearts covered with hair, which, in the opinion of *Lancisi* and *Haller*, were only lymphatic filaments attached to the surface of the heart or pericardium. *Senac*, also incredulous on this head, is equally unwilling to believe in the existence of hairy hearts in great men and in thieves, although *Aristomenes*, *Hermogenes*, *Leonidas*, and *Lysander*, were as remarkable, in their day, for the hair found in their hearts, as they were celebrated on account of their talents and splendid achievements.

SECOND CLASS.

DISEASES OF THE MUSCULAR SUBSTANCE OF THE HEART.

General Observations.

The muscular substance is that of which the central organ of the circulation is most essentially composed. It is that which performs the principal part in its organization and action, since from the contractility of the muscular fibre arise those movements which give an impulse to that fluid, to circulate which is the peculiar office of the heart.

This simple view is sufficient to enable us to conceive how serious those lésions must be, which necessarily produce an alteration, and sometimes even an annihilation of the properties of the muscular fibre. The action of the heart is, in this case, not only interrupted and fettered,

as in the affections of its membranous coverings, but actually changed in its principle. The circulation undergoes derangements proportionate to the disorganization of the viscus, which is its chief agent. These derangements soon extend to all the functions which are under the immediate influence of this function: hence originate all the serious and alarming symptoms which I am about to point out, together and in the detail.

Although some difference of structure exists between the ventricles and auricles, the parietes of these cavities are, nevertheless, mostly made up of the same muscular tissue. Indeed, in a healthy state, the particular arrangement of the fleshy fibres, and their smaller number, seem to constitute the only difference in the texture of the auricle; and it is merely in case of great dilatations or certain other affections, that the parietes of these cavities lose their muscular to assume a membranous character, or to undergo other changes.

I should have placed at the beginning of this class, inflammations of the muscular part of the heart, had I been able to give well proved instances of this isolated pathological state; but the simultaneous inflammation of different tissues of this organ, constituting in truth *carditis*, I shall not, after the example of some authors, place, this disease in the class of affections of the muscular tissue. If it were necessary to designate, among the various tissues, which are evidently affected in inflammation of the heart, that which is most so, perhaps, it might be imagined, that the cellular is more likely to suffer than the muscular, which is, indeed, always

affected, but much less than the former. In treating of carditis, under the title *of diseases which affect, at one and the same time, the different tissues of the heart,* I shall have an opportunity of explaining this proposition, so contrary to certain novel opinions.

The most common alteration which the muscular substance of the heart undergoes, is aneurism or dilatation. This substance is, in truth, not the only one injured in this affection; but the membranous coverings which are then affected, are only indirectly so, their dilatation appearing to be always simply passive, except in those cases where many kinds of lesions are united, and many tissues simultaneously affected.

Section 1.

OF ANEURISMS OF THE HEART IN GENERAL.

I wish to make a few prefatory remarks, before I enter materially on the disease in question. In every case of aneurism of the heart, I state that that organ is encreased in volume; I shall also have occasion to say, that in such and such a case, it had acquired double its natural size, &c. Every reader will readily see, that this calculation must always be merely approximative. We well know that its size varies, according to age, sex, temperament, manner of living, &c. but we want, and ever shall want, a perfectly exact standard, by which to ascertain the weight, the volume of a dilated heart,

thickened in its parietes, &c. This, then, is a mode of expression not strictly correct; but every practitioner, in adopting it, is aware of its want of exactness, as well as of the difficulty of obtaining a better.

In medical language the word *Aneurism* is used to express a dilatation of the heart, or of an artery. Thus to avoid mistake in the meaning, which may be affixed to this term, I always use it as a word expressive of an unnatural dilatation, either active or passive, of one, of several, or of all the cavities of the heart. When I shall have explained the difference between these various aneurisms, the propriety of not attaching any other meaning to the word than the one I have given, will be better understood. Once for all then, I shall use the words aneurism and dilatation, in a sense perfectly synonimous.

We must admit two kinds of dilatation of the heart, the one active, the other passive. The real existence of these two species is proved, to the physician by the different and proper symptoms of each; to the anatomist, by the uniform and frequent observation of the two very distinct states, in which the heart is found, when it has been the seat of this disease.

In the first species (active dilatation) the heart is dilated, its parieties are thickened, and the force of its action is increased.

In the second, (passive dilatation) there is evidently also dilatation, but with diminished thickness of the parietes, and a diminution in the force of action of the organ.

Although dilatations of the heart, and those of the arteries of the trunk, or its members, have

been designated under the same name, *Aneurism*, it would be difficult to establish between these two affections a sufficiently exact parallel to render the identity of names strictly proper. For example, what analogy is there between aneurism of the heart, in which there is thickening of its parietes with increase in their force, and an aneurism of the aorta, of the crural or the popliteal arteries? In truth, a greater resemblance will be found to exist between the aneurism of arteries, and that of the heart with thinning of its parietes; but still, how many points of dissimilarity remain?

The want of resemblance, which I have been pointing out, at best, relates but slightly to my subject; it simply proves an imperfection in nosology, which no one, I think, will call in question, and which it is more easy to perceive than to amend.

Section II.

OF ACTIVE ANEURISM OF THE HEART, WITH INCREASED THICKNESS OF ITS PARIETES.

The heart, like all other muscles of the human body, is susceptible of enlargement, a more solid consistence and an increased strength, by the continuance, and particularly by the greater energy of its action. Do we not daily observe the extraordinary enlargement of all the muscles of the body, in porters; of those of the arms, in blacksmiths, bakers, &c? Exercise in the external muscles, exercise and irritation in the heart, are the principal means of

giving to these organs, a more active centre of nutrition, and of thus increasing their substance. To render more clear and intelligible this fact, already pointed out by *Blancard*, let us suppose in a person, in other respects well formed, a heart of the ordinary size, having a degree of action proportionate to the mass of muscular fibres of which it is composed, but vessels disproportionate by the narrowness of their caliber, and consequently ill calculated to give vent to the quantity of fluid, which it is their office to let pass. The heart, in this individual, will have to drive forward, through the narrow arteries, too great a column of blood. These vessels, incapable of admitting this quantity, cannot, at first, sufficiently dilate themselves; they will oppose the progression of the fluid, which will necessarily react upon the agent which impels it. The first effect of this reaction will be to cause the extension, the elongation of the fibres of the heart; the second, to prolong the stay of the blood in the cavities of that organ, and consequently also to prolong the impression of its stimulus. Finally, the coronary arteries, as well as the capillaries of the heart, remaining in a permanent state of fulness, will supply more nourishing matter to the fleshy substance of this organ; whence arise, without doubt, the increase, at least in part, of its vital energy, and also the dilatation of its cavities; the elongation of its fibres, the thickening of their bands, the greater consistence of the parietes, and the more vigorous action of the organ.

The same causes, acting daily and hourly, will tend more and more to change the natural

state of the heart, as well as that of the arteries which spring from it: these latter will yield with less facility, the dilating power acting less directly upon their parietes, which, moreover, can oppose a greater relative resistance, by reason of their own organization, and the support which they derive from the pressure and action of the surrounding parts. The heart, on the contrary, free on all sides, formed of fibres, susceptible of great extension, and supported only by their own reciprocal union, will experience, in its organization, a change, which the same efforts will not produce upon the arteries. It is true, we sometimes see these vessels yield to the efforts of the blood, propelled forward by the heart, which itself, in some subjects, preserves its natural size, while the arch of the aorta, for example, undergoes a great dilatation; but, then, a peculiar and local weakness, produced by causes which will be explained in another part of this work, favours the dilatation of the vessel which becomes the seat of aneurism.

The formation of aneurism of the first species, does not always depend upon the want of proportion between the caliber of the vessels, and the quantity of blood which the heart has to send through them. Every obstacle to the current of the blood, whether it arise from faulty organization, from a pathological state, from the influence of moral causes on the action of the heart, from motions of the body, perhaps, also, from the more or less stimulating quality of the blood, must be considered among the causes of these aneurisms, since the effects

which they produce, and the derangements which they occasion in the circulation, appear to be the same in their consequences.

Section III.

OF ACTIVE ANEURISM OF THE HEART, WITH INCREASED THICKNESS OF THE PARIETES OF THE WHOLE OF THIS ORGAN.

What I have said, in the preceding section, of the mode of formation, and of the principal causes of active aneurism, or of the first species, naturally applies to the active aneurism of all the cavities of the heart; but it is very unusual to meet with subjects in whom all the cavities of this organ are at once dilated, and have, at the same time, increased thickness of their parietes. If every day did not confirm this assertion, reason alone would be sufficient to prove, that aneurism of the first species, or active, cannot, but very rarely, be formed at one and the same moment, and in an equally marked degree, in each side of the heart. To render this simultaneous affection possible, it is necessary that the two halves of this organ, and the two arterial systems which spring from it, should be in the same subject, and at the same time, in a condition favourable to the developement of the same disease. It is necessary, that an obstacle placed in one of the points of the general arterial system, and that another, equally placed in the pulmonary arterial system, should oppose the

free course of each circulation; it is necessary, that the different organization of the parietes of the two ventricles should oppose an equal resistance to the reaction of the blood, incapable, in the supposed case, of obeying the impulse it has received; it is necessary that each of the arterial systems, either by reason of their proper structure, or the peculiar state of isolation of some of their parts, should afford the same relative facility to a dilatation, in this case always indispensable; finally, it is necessary that the blood, forced to flow back into the ventricles, should retrograde as readily into the left, as into the right auricle, into the pulmonary veins, as into the venæ cavæ, &c.: now much is necessary before this can be the case. On the contrary, in the greater number of cases, we find that an obstacle to the circulation which produces active aneurism of the left ventricle, gives rise, consecutively, to aneurism of the second species, or passive, of the auricles or of the right ventricle, or even of all these cavities at once. When I speak of the manner of the formation of passive aneurism, I shall have an opportunity of pointing out other considerations, which will naturally link themselves to the observations which I have been making.

Although instances of active aneurism of all the cavities of the heart are extremely rare, and we much more frequently observe this affection in the parietes of one of these cavities only, and mostly in those of the left, I have still seen several of this kind among the cases I have witnessed. Here follows one.

Case 12.—A Wheelwright, aged 58 years,

of a strong constitution, felt, after violent exertion, an acute pain in the right side of the chest. Soon after an oppression, a cough, and a spitting of blood, took place. The extremities at length became œdematous, the face violet, puffed, and irregularly livid; the pulse strong, full, regular and frequent; the pulsations of the heart violent, sharp, hurried, but not irregular. The region of this organ sounded but feebly. The character of the pulsations of the heart, that of the pulse, the result of percussion, united to the other symptoms, left no doubt on my mind that this affection was an aneurism of the heart with thickening of its parietes.

The prognostic was unfavourable. I employed, however, many bleedings, in the hope of relieving the sense of suffocation, the spitting of blood, &c. but none of the symptoms yielded to these means,* and the patient died, three months after the violent effort which gave rise to the first phenomena of this disease.

On opening the body, the cavity of the right pleura was nearly full of water, and the inferior lobe of the lung of that side, hard and gorged with black blood.

The left cavity of the chest contained no water; the lung of this side was sound and crepitous.

The heart was double its natural size. Its length, from its base to its apex, was more than

* I shall observe here, once for all, that in the history of every case, I speak very briefly of the treatment; that most frequently I omit speaking of it altogether, either on account of its insufficiency, whatever it was, or because it will become the subject of an article *ad hoc* in the corollaries of this work.

eight inches. The parietes of the organ were much thickened; those of the left ventricle, however, were comparatively thicker and more solid than those of the right; the interior of these cavities was in a very good state. On which account, the pulse had been strong, full and particularly regular; a regularity which never exists, when, besides the dilatation, there is an organic derangement in the openings, the valves, &c.

I shall not treat more at length on active aneurism of the whole of the heart; what I shall say, in the following sections, on active aneurism, viewed in the different cavities of this organ, in particular, will, in a great degree, apply to the case of which I have been treating. Neither have I thought it necessary to give here a detail of the symptoms proper to this kind of lesion. To avoid the repetitions with which I should necessarily have troubled the reader, I have put off to the following chapter, an account of the signs of active aneurism in general, and the discussion of the particular phenomena which point out the affected cavity.

Section IV.

OF ACTIVE ANEURISM OF THE HEART, WITH DILATATION AND INCREASED THICKNESS OF THE PARIETES, OF THE LEFT VENTRICLE.

Numerous observations have convinced me, that the left ventricle is the most frequently affected with aneurism of the first species. The

particular organization of this ventricle, its peculiar connection with the vascular system in general, and with that of the heart in particular, seems readily to account for the greater frequency of active aneurism of the aortic ventricle.

Each of the ventricles, in a natural state, possesses a power proportionate to the degree of impulsion which it must give to the blood, and to the resistance which it has to sustain. The left, which has to propel this fluid through the whole extent of the general arterial system, is provided by nature with thicker and more muscular parietes, and consequently with greater strength. The right, on the contrary, having only to forward the blood through the limited extent of the pulmonary arterial system, requires no more than the moderate degree of strength, which it has received. This difference in the organization of the parietes of the two cavities, is the cause, that each, by reason of its own peculiar structure, has a disposition to become the seat of one or other of the different kinds of aneurism which I have specified.

I have given it as my opinion, that the blood, when it does not circulate freely, but accumulates, is the agent of dilatations of every species, is the dilating power, if I may so express myself, of the various cavities; but to this dilating power, the two ventricles oppose quite different degrees of resistance; the left palpitates, and strives against the obstacle; its parietes become distended, but their elastic or contractile power has a tendency to restore them to their natural and primitive size. This reciprocal action is incessantly repeated, and always to the injury of the organ, the force of which is mo-

mentarily overcome, rather than exhausted. In fact, these more violent efforts, this more powerful irritation, this more prolonged application of the stimulus of the blood, make, I repeat, of this part, a more active centre of nutrition, and of more energetic vital action; the parietes are become thicker, and more solid; the heart, far from being weakened, acquires fresh power, but this power is no longer in harmony with the resistance which it has to overcome, nor with the general organization of the individual. The equilibrium is destroyed, the organ is deranged, the principal function is disordered, and those functions which depend upon it are disturbed.

I should anticipate the history of passive aneurism or of the second species, if I were here to complete the parallel between the manner of formation of the different kinds of aneurism, of the left and right ventricle. I therefore defer what I have farther to say, on this subject, to the section on passive aneurism of the pulmonary ventricle.

The more frequent existence of active aneurism in the left ventricle may also depend on other causes. It is sufficient to observe here, that alterations of the mouth of the aorta, are much more common than those of the orifice of the pulmonary artery.

Here follow two instances of active aneurism of the left ventricle.

Case 13.—A Mantua-maker, aged 24 years, of a delicate constitution, (a proof that active aneurisms sometimes attack weak people) had been regular, for the first time, at 20 years of age. This periodical discharge went on

regularly for a year, when an intermittent fever suspended it for some time. From that period she began to experience frequent palpitations, occasional faintings, and an habitual cough. These symptoms had been preceded by a complete syncope,* which lasted more than two hours. This first attack of intermittent fever having subsided, the menstrual discharge became more regular, and for two years she enjoyed a less precarious state of health, when a fresh fever, the paroxysms of which lasted every day, eight or ten hours, took place, and again stopped the menses, which never reappeared. These paroxysms of fever ceasing, after being renewed ever day for a fortnight, her health became rather better; but it was soon again disturbed by great grief, much watching, and immoderate exertions. For three years, reckoning from the appearance of the first symptoms, she had had, continually, palpitations of the heart, and faintings, which often obliged her to stop when walking, or to suspend her work.

On the 5th of March, 1801, this woman, worn down by exertion and disease, was obliged to keep her bed. She then felt an extreme weakness in the extremities of the left side, which soon after terminated in a complete paralysis of that side. Fresh paroxysms of quotidian fever took place, and on the 11th of April, she was taken to the hospital.

The whole body was in the last degree of emaciation; she had no head-ach; the features were extremely changed, the face was pale, the

* Can a long continued syncope alone, lay the foundation of a disease of the heart? Can those who have been restored from a state of asphyxia or drowning be thereby more liable to it?

mouth foul, the breath fetid, the tongue dry and brown towards its base, the respiration high and frequent. She had slight pain in the right side of the chest. Extended pulsations were to be felt in the region of the heart, and a peculiar tumult was perceptible, even by the eye. The belly was not painful; the whole of the left side of the body had lost the power of motion, and was slightly œdematous; the pulse was small, weak and frequent, on the paralyzed side: but more free, and even sufficiently strong and frequent, on the right side.*

The aneurism of the heart was, in this case, notwithstanding its complications, too well characterized by the concurrence of certain symptoms, to leave me the slightest doubt as to the nature of the principal disease and its fatal termination. The patient was, at this time, in so dreadful a state, that she seemed very near her end. She passed, nevertheless, five days in the Hospital; her nights were disturbed by a continual sense of suffocation; she lay constantly on the paralyzed side. On the 15th of April, the symptoms became worse; the patient complained of pains in the chest; and, on the evening of the 16th, died, after a long and painful agony.

When the body was examined, the skin throughout was discoloured; the face violet,

* Does the difference in the pulse prove, that the nervous influence is weaker on the artery of the paralyzed side, &c.? The pulse is, nevertheless, very strong in the greater number of apoplectic persons, who are, notwithstanding, completely paralyzed. It is true, that the state of the subjects, the age of the disease, &c. are not similar.

puffed, and œdematous; the extremities, particularly on the left side, were also œdematous.

The substance of the right hemisphere of the brain was in a state of manifest decomposition, of a grey colour, and of the consistence of thick pap. The hemiplegia and œdema of the left side had announced this lesion.

The chest, on percussion, sounded well on the right side, but not at all on the left.

The left lung was lifted up towards the top of the chest, and reduced to half its natural size.

The right lung preserved its healthy state.

The heart occupied the greater part of the left cavity of the chest, and had acquired an extraordinary size, considering the small stature of the subject; the pericardium contained a little water.

The right cavities, and the left auricle of the heart, were a little distended, but presented no other traces of disease.

The left ventricular aperture was large; excrescences *(vegetations)* similar to venereal ones, were very visible on the mitral valve. The middle part of the floating edge of this valve, was surmounted by a tubercle of the size of a filbert, rising from it by a largish base. This tubercle had inequalities on its surface, which gave it much the appearance of a mulberry. Was this also a venereal excrescence?

The cavity of the left ventricle had acquired a very considerable size. Its fleshy parietes were much thicker than in a natural state.

The aortic opening was free ; the sygmoid valves were in their natural state. How did it happen, that all the signs of active aneurism, the strong pulse, for example, were not perceptible in this case ? Are the peculiar lesion of the brain, and the consequent diminution of nervous power, sufficient to explain this weakness of action, in apparent contradiction to what might have been expected from the thickening of the parietes ? For we must not forget, that the pulse, on the side which was not paralyzed, had a disposition to be tolerably strong, and, perhaps, it would have been completely so, if the brain could have more powerfully influenced the vital action of the heart. The excrescences, and particularly the tubercle on the mitral valve, appear to me to account for the tumult of the heart, and, in part, for the feebleness of the pulse, the faintings, &c. This explanation seems as plausible as the complicated state of the disease will permit.

Case 14.—A Baker, aged 36 years, of a strong constitution, had long been troubled with a great difficulty of breathing ; he had frequent palpitations, and violent beatings of the heart ; the region of this organ did not sound on percussion ; the pulse was regular, frequent, hard, and vibrating. During the palpitations, the jugular veins were observed to pulsate.

From the history of the disease, and its different symptoms, it was easy for me to recognize, on the first examination, active dilatation of the heart ; but it did not appear to me in a sufficiently advanced stage, soon to produce death.

In truth, he quitted and returned several

times to the Hospital of *la Charité* in the course of two months. During the different periods of his remaining there, I easily succeeded in restoring him to apparent health, of which he profited to go and attend to his business; but he was soon obliged, by the return of his complaint, to apply again for relief. Finally, during his last residence in the Hospital, he died suddenly.

On opening his body, I found no effusion in the cavity of the chest.

The pericardium adhered to the lung, as well as to the surface of the heart. The anterior surface of this organ was covered with points of a livid red.

The auricles had lost a portion of their original size, and looked shrivelled.

The right ventricle was dilated; its parietes were thin.

The left ventricle was still much more enlarged, and its parietes were so much increased, that in many places they were more than an inch in thickness.

In the first of these two cases, the aneurism of the heart, although distinguishable, did not present such well marked features as in other analogous cases. Many symptoms, foreign to the principal disease, existed, and threw obscurity on the diagnostic.

The hemiplegia, the cause of which was not doubtful, and which dissection proved to be in the right lobe of the brain; the paroxysms of intermittent fever, which, by their frequency and duration, had brought and kept the patient in a state of the greatest debility, were all likely to give rise to error, only to be avoided

by the most attentive and serious examination of the symptoms.

In the second case, the two species of aneurism, are seen united in the same subject; namely, active aneurism of the left ventricle, and passive aneurism of the right. The instances where these two affections exist together, are not uncommon, the passive dilatation of the right ventricle being almost a necessary, though more or less remote, consequence of the active dilatation of the left ventricle.

It is, nevertheless, difficult to explain the cause of sudden death in this case. Did it take place when the equilibrium, between the action of the right ventricle and that of the left, had attained a certain degree of derangement and disproportion? I know not.

Section V.

OF ACTIVE ANEURISM OF THE HEART, WITH INCREASED THICKNESS OF THE PARIETES OF THE RIGHT VENTRICLE.

As we have found in the organization of the left ventricle, and in the nature and consequences of its action, the cause of the greater frequency of active aneurism of this cavity, do we not, at the same time, learn, why the right ventricle is less exposed to this disease? What more I have to say on this subject, is so naturally interwoven with the history of passive aneurism, or of the second species, that it cannot be placed better than in the chapter where I shall treat of this particular kind of affection.

Although active aneurism more particularly belongs to the left ventricle, it is, nevertheless, certain, that the right, and even the auricles, are sometimes the seat of this disease. What, then, ought to be the state of this ventricle, that it should be disposed to undergo an alteration, which appears so foreign to its natural organization? We must necessarily suppose, in this case, as in many others, a natural organic predisposition, the possibility of which cannot be doubted by a candid mind, or its frequency by an observing one. Indeed, do not anatomists cite cases in which they have observed the transposition of the ventricles? Have they not also remarked, in some subjects, that the right ventricle had naturally, and not as the effect of a pathological state, greater thickness and strength than the left? Do we not observe every day, in the various parts of the human body, examples of similar varieties and irregularities of organization?

Moreover, without recurring to these complete transpositions, which are not the less rare because they have been cited by several authors, daily observation proves that the different cavities of the heart are not always formed of parietes, the thickness and strength of which are such as they ought to be. Thus the right ventricle, the parietes of which are usually loose and soft, possesses, in some subjects, considerable solidity of texture. Beyond all doubt, these differences, for the most part, depend upon individual constitution; but it is also evident, that individual constitutions are true dispositions to peculiar diseases, particularly organic.

The right ventricle may then, from even a

slight variation in its organization, become, though very rarely, the seat of active aneurism; in the same manner as a varied organization of the left ventricle may sometimes favour the formation of passive aneurism in the left side of the heart; though it is much less frequent than the first species.

To the cases of this species of lesion recorded by old authors, I will add one, taken at hazard, from those which I have seen.

CASE 15.—A man, aged 38 years, of a sanguineous and vigorous constitution, but very irascible, was desirous, in a fit of passion, to destroy himself.* He was soon afterwards seized with violent palpitations, which were renewed by the least motion.

Having passed more than eight months in this deplorable state, he came into the Hospital. His face was then swollen, and much suffused; the chest, on percussion, sounded on every side; nevertheless, he experienced excessive difficulty in breathing; the heart beat with violence, the pulse was frequent, hard, vibrating but irregular.

I readily recognized a dilatation of the heart, but the situation of the patient gave little room for hope, from any means that could be employed, and they were employed in vain. The disease still gaining ground, he died as if suffocated, and sooner than was expected.

* It would have been well to have known in what manner, and what was the person's business.

On opening the body, I found the lungs nearly as in a natural state.

The heart was of an enormous size.

The right auricle was much dilated.

The right ventricle had also acquired an unnatural size; its parietes were considerably thickened.

The left cavities were in a natural state.

The fleshy substance of the aortic ventricle appeared less firm, than that of the pulmonary ventricle.

The mouth of the aorta, unequally indurated, was rather dilated than contracted.

The fit of passion, in which this person wished to destroy himself, appears to have been the only exciting cause of the disease. I shall have occasion, towards the close of this work, to point out how powerful moral causes are, in producing dilatations of the heart.

The case which I have cited, proves the existence of aneurism of the first species, in the right ventricle; but it does not afford any signs, by which it may be distinguished from the same affection of the left ventricle.

It is, nevertheless, possible to point out several symptoms, the union of which may enable us to distinguish this kind of lesion, and I shall endeavour to do this, in the section in which I shall treat of the signs of all the aneurisms.

Section VI.

OF ACTIVE ANEURISM OF THE HEART WITH INCREASED THICKNESS OF THE PARIETES OF THE AURICLES.

If the relative dilatability of the parietes of the right ventricle, for the most part, protects this cavity against the formation of active aneurism, with still greater reason should the auricles, from their weaker texture, be less exposed to this kind of lesion. This tissue is so extensible, compared with that of the ventricles, that whatever may be the nature of the impediment to the freedom of the circulation, the action of the blood upon the parietes of these cavities, distends and dilates them with an ease which does not allow their fleshy substance to contract a more than natural degree of thickness. I may therefore affirm, as an inference from what I have said, and in anticipation of what I shall hereafter say, that if active aneurisms of the first species, more especially belong to the ventricles of the heart, and particularly to the left ventricle, that of the second species, or passive dilatation, affects most frequently the auricles.

However, there are instances, rare it is true, of active aneurism of the auricles. Several are to be found in the works of different authors, and I have myself seen some.

Case 16.—A Printer, aged 27 years, of a bilious and sanguineous temperament, experienced

at the beginning of the revolution, great grief, caused by the massacre of a part of his family, and by the loss of his fortune. This young man, forced by circumstances to become a soldier, had to undergo all the fatigues of war. He caught the itch, for which he frequently anointed, but without success, the disease never having completely disappeared. Some months after, he was seized with an extreme difficulty in breathing, which lasted for a month, accompanied by a sense of suffocation, and palpitations, particularly when he walked fast. In the course of the first year, these symptoms appeared only at intervals; but, during the first month of the second, they became more alarming. On his admission into the Hospital, on the 19th of January, 1800, two years after the appearance of the first symptoms of this complaint, his face was pale, the chest sounded tolerably well; he could not lie on the left side, without bringing on the sense of suffocation. The belly was in a good state, the pulse, in both arms, but especially in the right, was hard, small, frequent, feeble, and intricate. In the region of the heart, however, strong and quick pulsations were felt, and it did not sound on percussion.

The variance between the phenomena of the pulse, and the pulsations of the heart, soon caused me to recognize an aneurism of that organ, complicated with a contraction of one of the left orifices.

The plethoric state of the patient, indicating the propriety of bleeding, he was bled once, but, as I had foreseen, only a momentary relief ensued. The symptoms became more unfavourable; the palpitations were much more

frequent, particularly during the night, which the patient was obliged to pass sitting upright. The little sleep he had was much disturbed. The cough became more obstinate, the expectoration tough and viscid, dark coloured, and as it were charcoaly.

Preparations of squills appeared to do good.

On account of the psoraic affection, which had re-appeared from time to time, remedies were used for that disease. A blister was also applied to the left arm, which was so far from affording benefit, that the situation of the patient became more and more deplorable. The cantharides operated powerfully on the bladder, and almost entirely suppressed the secretion of urine, which was before in small quantity. I immediately abandoned a treatment more injurious than beneficial, and the irritation went off by the use of emollients and anti-spasmodics. But the sense of suffocation, and palpitations, still remained; anasarca of the extremities, superior and inferior, began to shew itself, and the pulse became more and more obscure and imperceptible.

In this state of suffering the patient went on, from the 21st of January to the 2d of March. On the 3d of this month, the sense of suffocation became continual; the chest was harassed by a very frequent cough, and a painful expectoration. The urine was still more scanty, and the anasarca proportionally increased. Appetite and sleep were entirely gone. All the functions, more or less interrupted, went on from bad to worse. The patient, naturally melancholy, became daily more gloomy, sad, and thoughtful.

No longer able to bear the weight of so painful an existence, he was planning some mode of delivering himself from it, when he suddenly died on the 20th; two years from the commencement of his disease, and two months from his coming into the hospital.

On opening the body I found the right lung very small, and adhering on every side to the pleura, which was thickened, and even cartilaginous, in several parts. The left lung was sound, but larger than in a natural state, and pushed the heart towards the right cavity of the chest.

The pericardium was extremely dilated. The heart was three times its natural size.

The two auricles, and particularly that of the venæ cavæ, were the only parts of the heart affected by active aneurism. The orifices of the right cavities were free and unaltered, but instead of the aperture communicating from the left auricle into the ventricle of the same side, there appeared, simply, a small slit, about five lines long and one broad. This slit surrounded and formed by an osseous pad, of the thickness of the finger, could neither dilate nor contract. Upon this pad, towards the auricle, inequalities, like little osseous excrescences, quite bare, could be felt.

The ventricles were in a natural state.

The mouth of the aorta, and this vessel itself, were in a healthy state; but the venæ cavæ were enlarged to three times their natural size.

From among the different cases, which I have seen, of this species of aneurism, this is selected, because, besides the interest which it

excites, from the causes which appear to have produced it, it has also the advantage of shewing, in the same subject, the simultaneous developement of active aneurism of the two auricles of the heart; the cause of which it is not difficult to understand. In fact, the left auricle being incapable of emptying itself with ease into the left ventricle through the osseous slit, into which its opening of communication had changed, the blood, which flowed into it, choaked up its cavity, and at one and the same time dilated and thickened its parietes. The same reasoning applied to the right auricle, equally accounts for its dilatation, as well as that of the venæ cavæ; it would be difficult to explain why the right ventricle, placed between two dilated and gorged auricles, did not, itself, undergo some degree of dilatation;—as happened in the subject of the following case.

Case 17.—On opening the body of another person, who had died in the Clinical Ward, after having evinced, during the latter part of his life, all the symptoms of active aneurism, I found the parietes of the left auricle, dilated and much thickened: this disposition was common also to the right auricle and ventricle. These simultaneous affections may be expected frequently to take place, when an osseous, and consequently undilatable contraction of the left ventricular aperture, forces the blood to linger in the left auricle, in the pulmonary veins, in the capillary arteries of the lungs, in the right ventricle and auricle, in the venæ cavæ, &c.

I here conclude what I had to say on aneurism of the first species, or active dilatation in the various cavities of the heart. The signs

proper to this affection, those which may serve to distinguish it from other lesions, shall be given more at length in a particular chapter, after the history of aneurism of the second species, or passive dilatation. At first view it may appear better that the detail of these symptoms should be placed here, as the attention would be less diverted; but, on reflection, I think that the reader will derive more benefit, by finding the collection of symptoms at the end of the history of both active and passive aneurisms; because the parallel which will result from comparing the signs of each, will render them much better understood and distinguished.

CHAPTER

CHAPTER THE SECOND.

Section 1.

OF PASSIVE ANEURISM OF THE HEART, WITH DIMINISHED THICKNESS OF ITS PARIETES.

The accumulation of blood in the cavities of the heart, the more prolonged irritation of their parietes, the more active and penetrating circulation of this nutritive fluid, in their fleshy substance, the strong reaction of their muscular fibres, have enabled me to explain the formation of active aneurism in general, and that of the left ventricle in particular; other remarkable phenomena will render equally clear the manner in which passive aneurism takes place. This second species of aneurism, which causes the parietes of the heart to become thinner and weakens the action of that organ, follows, in its formation, a perfectly different course from that of active aneurism.

In aneurism of the first species, the heart appears to become the centre of more active nutrition and circulation. In that of the second, on the contrary, this organ distends itself in the same manner as the bladder, in cases of retention of urine. The urine, in this latter case, gradually accumulating, distends the musculo-membranous pouch, which serves it as a reservoir; the coats of the bladder, thus losing their thickness, acquire an extraordinary volume; they lose, at the same time, with their spring, and almost all their contractile power, the faculty of ex-

pelling their contents. When the accumulation of urine has brought the bladder into the last degree of distention, the extreme thinness of its coats may cause it to rupture in its weakest part. This naturally produces an effusion of urine in the abdominal cavity, or its infiltration among the neighbouring parts. Instances of this kind have occurred.

In passive aneurism, the heart is dilated nearly in the same manner. The blood, which ought to pass from the auricle into the corresponding ventricle, finding an obstruction at the aperture of this latter cavity, or in some more distant point of the circulation, lingers and accumulates in the auricle, the parietes of which it insensibly dilates. This dilatation causes them to become thinner, and to lose their spring and contractility. These various changes finally dispose them to rupture, which would, indeed, be the necessary termination of this disease, if the derangement which it produces in the circulation, and the functions dependant upon it, did not cause death before there has been sufficient time to allow the dilatation to reach the point which would render the rupture of its coats inevitable; an accident not without example. We might, perhaps, push still farther the comparison which I have been making between the passive dilatation of a cavity of the heart, and the distention of the bladder in cases of retention of urine, by adverting to the ureters secondarily dilated, as happens to the venæ cavæ, and the pulmonary veins in the different aneurisms; but the first points of analogy are sufficient for my purpose, and it is useless to insist still farther on these considerations.

A natural debility, a deficient excitability, a serous diathesis, blood deficient in its stimulating properties, appear to me to be, perhaps, necessary to give rise to, and certainly to favour the action of causes of passive dilatation, &c.

Such is my view of passive dilatations in general. I have only to say what I think of the manner in which these dilatations are produced when they occupy all, or some particular cavities of the heart.

Section II.

OF PASSIVE ANEURISM OF THE HEART, WITH DIMINISHED THICKNESS OF THE PARIETES OF ALL THE CAVITIES OF THAT ORGAN.

There are certain conditions necessary to the formation of passive aneurism, according as it may affect all the cavities of the heart, or one or other of them in particular. The condition which seems most to favour the passive aneurism of the whole heart, is the partial obliteration of the aortic orifice; and it is in this case alone, or in some analogous one, that a general dilatation can take place, particularly when there also exists a natural or acquired debility throughout the system, or in this organ only. The blood being stopped, at the moment when it should quit the heart, accumulates successively, 1st, in the aortic ventricle; 2d, in the left auricle; 3d, in the pulmonary ventricle; 4th, in the auricle of the venæ cavæ. Each of these cavities makes ineffectual efforts to expel, by a complete contraction, the fluid it contains; but the open-

ing through which it has to pass, being already too narrow to allow the passage of the column of blood which the heart, in a healthy state, should send through it, can still less make way for the quantity which is then accumulated.

Instead of saying that the contraction of the aortic orifice is one of the conditions favourable to the formation of passive aneurism of the whole heart, I ought, perhaps, to say, that this condition is almost absolutely necessary. For how can the left ventricle become the seat of this aneurism, if the impediment to the circulation were situated, for example, in the left ventriculo-auricular aperture? In this case, dilatation in the left auricle, the pulmonary ventricle, and the right auricle, alone would occur. In the same manner, a contraction in the mouth of the pulmonary artery should only produce dilatation in the right ventricle and auricle; thus also the contraction of the right ventriculo-auricular aperture can only favour a dilatation of the auricle of the venæ cavæ, and of those veins themselves. Moreover, we may, without danger of being contradicted by observation, maintain, that where one of the cavities of the heart is dilated, the left auricle, for instance, in consequence of an obstruction existing at the left ventriculo-auricular aperture, then the ventricle of that side, far from becoming morbidly dilated, should necessarily lose something of its natural capacity, because receiving a less quantity of blood than it would do in its natural state, the muscular fibres are abandoned to their retractility by the continual, though incomplete vacuity of the cavity; hence arise the contraction of the parietes of the ventricle and the diminution of

its capacity. This diminution in the size and capacity of the left ventricle, caused by the same contraction which produced the dilatation of the auricle of the same side, will equally take place, and for the same reasons, in any other cavity of the heart which may be similarly circumstanced.

From experience, therefore, we may establish the two following propositions.

Ist, The formation of passive dilatations of the whole heart, or of one or more of its cavities, always presumes an impediment to exist in the circulation, and, in following the course of the blood, that it is placed before all its cavities, or before that which is the seat of dilatation.

2d, The heart, which, in aneurism of the first species seems incessantly to employ its natural action in increasing the existing organic lesion, is, in aneurisms of the second species, an organ almost as passive as it appears to be active in the first; let us cite some cases of these passive dilatations.

Case 18.—A Farrier, aged 40 years, was admitted on the 4th of May, 1801, into the Clinical Ward; he gave but an imperfect account of his complaint; he said he had been ill only three months, while the alteration in his countenance and person, announced a disease of longer standing. His complexion was pale and yellowish, his face puffed and œdematous, his cough frequent, his breathing high, short, and interrupted; when the chest was struck, it did not sound in the region of the heart, but a fluid was felt which appeared to spring back. The legs and thighs were considerably œdematous,

the belly was swollen; the pulse feeble, small, rather frequent and irregular.

Although it was not possible to obtain more precise information concerning this disease, the *Facies* of the patient, the state of the breathing, and of the pulse, the want of sound in the chest, the peculiar rustling in the region of the heart, left me no doubt of the existence of a dilatation of that organ, and of a contraction of the aortic orifice; changes which I said would probably appear on opening the body.

The debility, sinking, and threatening suffocation, foretold the certain and speedy death of the patient; which happened the day after his entrance into the hospital.

At the time of opening the body, the cheeks, and particularly the lips were bluish, and the veins of the whole body much gorged with blood. The chest sounded well throughout the right side, but not at all, even for a considerable extent, in the region of the heart.

The pericardium contained but little water.

The heart was extremely dilated and full of blood; its parietes were soft, flabby and weak, the right auricle was large, but with little consistence, the ventricle, of the same side, was also extremely capacious; the aperture of communication between these two cavities, was likewise very large.

The left auricle was large and wide, like the ventricle of the same side; their communicating aperture was also dilated.

The mouth of the aorta was contracted, its valves were thickened and curled up; its internal surface, where it is nearest the heart, was hard, much granulated, and even ossified in some points.

The lungs were not altered.

There was a considerable quantity of water in the abdomen; the viscera, contained in that cavity, were sound.

Here follows a case in which of the four cavities of the heart, only three had undergone passive dilatation.

Case 19.—A Salesman, aged 34 years, of a robust constitution, was affected, in the course of the year 1794, with an inflammation in the abdomen, and also of the right side of the chest.

In 1795, this man experienced, for the first time, palpitations, to which he paid little attention, until the month of December, 1799, when he felt much difficulty in breathing, accompanied by acute pain in the abdomen, particularly towards the epigastrium. When he walked, he also experienced a sense of suffocation, which obliged him suddenly to stop. These symptoms were generally less intense, in proportion as the palpitations were greater. The legs were not œdematous.

When this patient came into the hospital, on the 8th of May, 1800, his countenance was wan; he could not speak without pain; he could lie indifferently on either side. On applying the hand to the region of the heart, quick and diffused pulsations were perceptible, the pulse was narrow, frequent, irregular, and fluttering in the right wrist, but quite imperceptible in the left.

His first stay in the hospital lasted two months. He was once bled, but with little advantage. He was then put upon a mild plan,

which he pursued with benefit till the 28th of June, when, finding himself better, he returned home. But very soon afterwards his legs began to swell. The effusion went on, gradually, till it reached the trunk. During the four months he remained at home, all the symptoms became much worse. He lost his rest, and could not quit his bed. He coughed with pain, and expectorated blood of a vermilion colour, and nearly pure. Finally, on the 26th of October, a year from the period when the symptoms had become tolerably well marked, he was brought, for the second time, into the Clinical Ward. His head was then heavy and painful, his face bloated and suffused, and his lips much coloured. The right cavity of the chest sounded well when struck. The left gave a sound equally distinct, except in the region of the heart, where it gave none. The pulsations of that organ were felt over a wide surface, even to the xiphoid appendix. The degree in which the lungs were loaded, might be conceived from the threatening suffocation, and the frequent spitting of blood. The belly was swollen, and its parietes œdematous. Some fluctuation might be felt in the abdominal cavity. There was pain about the epigastrium. The appetite was good, but the digestion bad.

The pulsations of the radial, labial, and temporal arteries, were not to be felt; those of the carotid arteries were very tumultuous. The brachial had frequent, but weak pulsations. They were sufficiently regular for some seconds; yet, in a moment after, nothing was to be felt but a hurried and tumultuous trembling, which could not be counted.

From these various symptoms, and the previous history of the complaint, I recognized the contraction of the aperture of communication between the left auricle and ventricle, accompanied by a dilatation of one or more of its cavities, as forming the principal lesions of the heart.

The prognostic which I had considered as very unfavourable, during his first residence, appeared to me much more so, on his return to the hospital, when I reflected on the rapid progress the disease had made in four months.

This patient, readmitted into the hospital on the 26th of October, passed the two following days in nearly the same state. On the 29th he was extremely harassed by a frequent hickup, which tormented him for a long time. He had also pain throughout the chest, particularly on the right side. The expectoration had the appearance of corrupted flesh. The urine was scanty, but light coloured. The stools were liquid, and resembled what are called the scrapings of the bowels. On the 30th, the lips were dry and crusty, the beating of the heart much harassed the patient, and the pain of the right side was more acute. The next day, at three in the morning, he died, as it were from suffocation, in the full possession of all his mental faculties. There was an excessive fog on that day.

At the time of examining the body, which I opened forty-eight hours after death, the face was suffused, the lips were violet, the skin, throughout the body, was yellow and streaked with violet on the sides of the trunk. The chest, when struck, sounded well on the right

side, but not at all on the left, which also appeared more elevated than the right. The external muscles of the thorax were œdematous. The right cavity of the chest contained a considerable quantity of bloody fluid. The lung of this side was gorged with blood; its texture much resembled that of the spleen.

The distended pericardium occupied a considerable portion of the left cavity of the chest. It pushed upward the left lung, which adhered to it. On opening this membranous pouch, there appeared a small quantity of yellowish fluid; adhesions had taken place between this membrane and the exterior surface of the right auricle. About this part there was also a layer of lymph of no great extent.

The heart was enlarged to double its natural size, and nearly full of blood. The right auricle, very much dilated, communicated by a very large aperture with the pulmonary ventricle, which had also undergone considerable dilatation. The parietes of these cavities were flabby and very thin; the left auricle was also dilated. Its aperture of communication, with the ventricle of the same side, was a kind of elliptical cleft, the greatest diameter of which was about eight lines, and its smallest about one. The substance, which surrounded this opening, was cartilaginous, and even partly ossified. It, moreover, had excrescences upon it, some of which were soft, and some bony.

The left ventricle was in its natural state. The aorta had nothing peculiar, but the diminution of its caliber, which would scarcely admit the introduction of the fore-finger. That also

of the subclavian and axillary arteries was much smaller than usual.

In the first case reported in this section, we find an instance of general passive aneurism, which is always caused by a contraction of the aortic orifice, or some other analogous alteration.

In relating the second, my object was to prove what I had advanced, that in passive dilatations of the heart, the only cavities which can be affected are those, which, in the current of the blood, lie behind the impediment to the circulation.

In the last cited case, the left ventricle preserved its natural size, because nothing opposed its emptying itself. Under these circumstances, we ought not to consider the diminished caliber of the aorta as an impediment to the circulation, but simply as the effect of the natural elasticity of the arterial tube, which not receiving, after the auricular aperture became contracted, a quantity of blood sufficient to fill its cavity, had become narrower, but still preserved a caliber, perhaps larger than necessary for the column of blood which it had to transmit to the general arterial system.

The same circumstances account for the diminution of the caliber of the subclavian and axillary arteries; and, I doubt not, that if the dissection of the arteries had been carried still farther, I should have found a gradation of contraction proportionate to the diminution of action or excitement on the one hand, and to the fibrous, membranous, &c. reaction on the other. The same effect takes place in an infinity of cases, in divers tissues, in different parts, and even in

entire organs, wherever their ordinary action is diminished or suspended by some disease not immediately affecting themselves: thus we see the stomach, the intestines, the spleen, the liver, &c. diminished in size, without any other alteration; and sometimes this state is noticed as pathological, while it is nothing but the physical or organic effect necessarily resulting from the want of action in those organs, during the disease which the patient has undergone. These considerations are susceptible of important and interesting investigation: but to return.

Section III.

OF PASSIVE ANEURISM OF THE HEART, WITH DIMINISHED THICKNESS OF THE PARIETES OF THE LEFT VENTRICLE.

Although the parietes of the left ventricle possess a strength proportionate to their thickness, still the passive dilatation of this cavity is frequently observed. When I speak of the passive aneurism of the right ventricle, (an article which I intend to discuss more in detail, because this cavity of the heart is the most frequent seat of this affection), I shall point out the peculiar conditions which I believe necessary to the formation of passive aneurism of the different cavities. However, I may observe here, by way of anticipation, that, in both cases, passive aneurism forms in the same manner. When there is an obstacle to the current of the blood, the muscular fibres of the heart exert a

fruitless action on the mass of fluid which the ventricle contains; not succeeding in impelling it forward, the fibres lengthen, the cavity enlarges, the parietes grow thinner, and a dilatation forms. Example.

Case 20.—A Blacksmith, 41 years old, of a robust constitution, had been, for three years before his death, troubled with numbness, frequent colds, and palpitations; he had also suffered great grief, which, for a time, had deprived him of reason. At the time of his entrance into the Hospital, his cheeks were violet; the rest of the countenance was pale; his features were altered; the lips deep coloured; the breathing was high, short, and interrupted. On percussion of the chest, it did not sound in the region of the heart, where feeble, frequent, and extended pulsations, were perceptible; the pulse was weak, frequent, and sometimes intermittent.

This collection of symptoms left me no doubt as to the existence of passive dilatation. The patient was, otherwise, in the worst possible state. In fact, he died the day after his entrance into the Hospital.

The face was pale, puffed, and yet emaciated.

The extremities were œdematous.

The right lung was sound. The left lung was pushed upwards by the heart, which occupied the greater part of the left cavity of the chest.

The pericardium contained a little yellow serum.

The heart was of an enormous size, and of a soft and flabby consistence; the right auricle and ventricle were rather large. The left cavities, but particularly the ventricle, were very much dilated; its parietes were thinned; their fibres soft, white, and easily torn. The beginning of the aorta was studded with numerous ossified points, which extended even to the sigmoid valves, and much diminished the orifice of this artery.

The passive aneurism of the left ventricle, uncomplicated with any other dilatation, is rare. My experience has furnished me with but few instances of it. We find some facts of this kind in different authors; but, in the greater number of cases, the passive dilatation of this ventricle is complicated with an affection of one or more of the other cavities of the heart, particularly the right. I have before pointed out the cause.

Section IV.

OF PASSIVE ANEURISM OF THE HEART, WITH DIMINISHED THICKNESS OF THE PARIETES OF THE RIGHT VENTRICLE.

The dilatation of the pulmonary ventricle is rarely isolated from that of its corresponding auricle. This pathological fact agrees perfectly with what we daily see in persons, who died of some other disease than an organic lesion of the heart. We find the right auricle and ventricle of this organ equally dilating from the

accumulation of blood which takes place in them in the last moments of life.

However, the strength of the parietes of the auricle may be such as effectually to resist the action of the blood, which, in this case, will be thrown entirely on the fibres of the right ventricle, and make it the seat of dilatation. The hardness and the alteration of the tricuspid valves, the loss of a portion of their mobility, are likely to contribute much to the formation of this isolated aneurism. But the thickening of the parietes of the right auricle, as well as the alteration of the tricuspid valves, are two uncommon states; and this is the reason why passive dilatation of the right auricle almost always accompanies passive dilatation of the ventricle of the same side.

But here follow two cases of passive aneurism of the right ventricle, isolated from any other dilatation.

Case 21.—A Cook, aged 60 years, of a weak constitution, had been long subject to catarrh. Six weeks before the 22d of March, 1801, the day of his admission into the Hospital, after carrying much too heavy a burthen, he suddenly felt an extreme difficulty in breathing, and an acute pain in the left side of the chest. At the time of his coming to the Hospital, his face was pale, wan, and bore the expression of a serious disease; he had no pain in the head; the tongue and mouth were in a natural state; the breathing was difficult in the highest degree; the cough strong and frequent, with an abundant expectoration of mucus. The chest sounded well on every side, except in the region of

the heart, where it gave no sound, and where frequent and extended pulsations were felt. The patient could not lie down horizontally, but preferred sitting upright; the pulse was frequent, soft, small, and regular; it had, however, now and then, some slight irregularities; the palpitations were frequent; violent sensations of suffocation obliged him sometimes to pass the night on a chair; his sleep was troubled with dreams, and he frequently awoke with startings.

This collection of symptoms was more than sufficient to point out to me an aneurism of the heart; the weakness of its pulsations, the softness, the feebleness of the pulse, &c. enabled me even to announce the species of dilatation.

This patient remained two months at the Hospital, during which time the disease made a rapid progress; the sense of suffocation increased; the extremities became œdematous; the countenance more and more altered; and he inclined his body to the left side.

Emollients, diuretic drinks, antispasmodics, and, at length, more powerful diuretics, were taken constantly during these two months, but procured little relief, and did not impede the course of the disease.

On the 19th of May, the breathing was extremely difficult, the face bluish and bloated, and the lips were violet; great drowsiness and delirium existed: in the region of the heart nothing more than a rustling was to be felt, not at all resembling the pulsations of that organ.

The 22d, the pulse was feeble, frequent, deep, and irregular; the weakness greater;

the oppression rather less; the sub-cutaneous veins were swollen and gorged with blood.

After that day, the symptoms became continually more alarming; and, on the 25th he expired, after having been in the Hospital two months.

At the time of opening the body, the lips were injected and bluish; the extremities œdematous. The right cavity of the chest contained about a pint of serum; the left about half that quantity; the lungs were healthy and crepitous, except the inferior lobe of the left lung, which was flabby, and its cells were in part void of air.

The pericardium contained but little fluid. The heart was excessively large; its morbid size was owing to the extraordinary dilatation of the right ventricle, the parietes of which were much thinned.

The ventriculo-auricular aperture of this side was very large; the right auricle, however, had acquired no extraordinary volume. The left cavities presented nothing remarkable. The orifice of the aorta was unequally hard, uneven, and contracted; the opening and the beginning of one of the coronary arteries were in a state of considerable ossification.

The disease to which this man fell a victim, was evidently owing, in the first instance, to the frequent catarrhs to which he was subject. These laid the foundation of passive dilatation, by the obstacle they occasioned to the pulmonary circulation; because, during the cough, the blood was forced back, by jerks, into the right ventricle, &c. Of what nature was the acute lesion of the heart, produced by the violent

efforts which he made to lift too heavy a burthen? Was it a rupture of some of the already weakened fibres of the right ventricle? I am disposed to think so.

The complaint lasted only between three and four months; these diseases do not proceed slowly. I believe I may safely affirm, that when aneurisms succeed to a sudden injury of the heart, their progress is always rapid.

Here is another example of passive dilatation of the right ventricle alone.

Case 22.—A Coachman, aged 63 years, had had, about seven months before he came to the Hospital, a slight peripneumonia, which was removed with ease; but it left behind it, a difficulty of breathing, slight at first, but, finally, so violent as to oblige him to keep his bed, where he could not however, lie in a horizontal position.

This patient, as I said, came to the Hospital seven months after the beginning of his illness. His face and lips were then suffused and violet. A slight tumultuous motion was felt in the region of the heart, instead of the pulsations of that organ. This region did not sound in the least, on percussion, for a considerable extent. The pulse was small, frequent, deep, and irregular. The patient coughed often, and with violence; he expectorated, with pain and difficulty, a viscid matter mixed with black blood.

The diagnostic did not appear more difficult in this case than in the last; the disease was equally advanced; the prognostic not less melancholy. The treatment was the same and not more fortunate.

In fact, the disease advanced with rapidity; the body became daily more œdematous; the face bluish; the extremities cold; the pulse and motions of the heart imperceptible; the cough weak and continual. The expectoration consisted of black blood, curdled, and, as it were, decomposed. The patient died a month after his entrance into the Hospital.

The face, and indeed the skin throughout the body, had a bluish, or rather ecchymosed appearance, similar to what existed during life. I found a small quantity of fluid effused in the thoracic cavities; the lungs were hard and gorged with blood, resembling that which was brought up by expectoration.

The pericardium contained but little serum; the heart was of an enormous size, in consequence of the dilatation of the right ventricle, which formed near the mouth of the pulmonary artery a very large cavity, the parietes of which had not even their natural thickness.

The right auricle, as well as the left cavities, were in a natural state.

The aortic mouth was rugged, slightly contracted, and ossified in several points.

In this case, the peripneumony appears to have been the cause of the disease; for we cannot but consider the gorged state of the lungs which it excites, as a powerful obstacle to the current of the blood, In this state of things, how greatly must the violent cough contribute towards causing a dilatation of the heart, to which affection it might also be disposed, as well from a natural weakness of organization, as from some antecedent disease!

In those cases, when the gorged state of the lungs, caused by the peripneumony, ceases with that disease, it still frequently happens that the organic lesion has taken deep root. Frequently also this state does not entirely disappear, a circumstance which contributes so much to increase the dilatation that nothing can arrest its progress.

Section V.

OF PASSIVE ANEURISM OF THE HEART, WITH DIMINISHED THICKNESS OF THE PARIETES OF THE RIGHT AURICLE.

After what has been said in the preceding sections upon aneurism of the second species, it will be easy, with an anatomical inspection of the different cavities of the heart, and an investigation of the direct and indirect connexion of their action with that of the neighbouring organs, to decide, which of the cavities of this viscus is most frequently the seat of passive dilatation.

The parietes of the right auricle, being much thinner than those of the other cavities of the heart, are, from this circumstance alone, more subject to unnatural dilatation; but this primary cause is not the only one, and many others, though of a different nature, do not less deserve our attention.

I have said that, in active aneurism, the coronary arteries, placed at the mouth of the

aorta, are distended even into their capillary ramifications with much more than a natural quantity of blood; that this arterial blood swells the muscular substance, to which it also furnishes a greater number of nutritive particles; and, that the increased thickening, partly arises from this unusual afflux and extraordinary penetration. But it is not so with the auricle and ventricle of the right side. Anatomical and physiological enquiries teach us, that the sanguineous distention which exists in these cavities, when dilated, cannot so easily determine to the vascular system, proper to the heart itself, as when the same circumstance takes place in the left cavities, which alone can convey blood to the substance of that viscus.

The numerous obstacles to the current of the blood, either in the lungs, by the multiplied affections of this organ, by the frequent derangement of its functions, or in some parts of the circulating system, by particular alterations, which I shall presently point out, are undoubtedly the mediate causes of passive dilatation of the right auricle; of which here is an example.

Case 23.—A Woman, aged 42 years, whose father, as she said, died of a disease analogous to that with which she was affected, had enjoyed good health until the age of 32, when she felt, for the first time, a slight pain in the region of the heart, and a disturbance in the action of that organ. These symptoms were much increased by motion, and when she put her hand upon the præcordial region, she felt strong and quick throbbings. For three years together,

the health of this woman was not otherwise affected, till the emotions caused by the bloody scenes of the revolution, added to the palpitations and difficulty of breathing she had before experienced, other symptoms, such as tremblings of the extremities, and convulsed motions of the whole body. For several years the disease remained nearly stationary; but about a year before I first saw her, the menstrual discharge, which had hitherto been regular, stopped, and caused a swelling of the abdomen, and an increase of the dyspnœa. Leeches were applied to the vulva; the menses re-appeared, but did not diminish the vertigo, the dimness of sight, the weakness and trembling of the lower extremities, particularly that of the left side, or the faintings.

On the 11th of October, 1797, this woman was admitted into the Hospital.

Her face was of a dull white, her cheeks were swollen, her tongue was in a natural state, the lower lip of a violet blue; the chest did not sound in the inferior half of the left side; breathing was exceedingly difficult, and could only be performed when leaning to the right, or lying on the back, with the chest much elevated, and inclining to that side. When she lay on the left side, she had a sense of great oppression, accompanied by an acute pain which she referred to the false ribs. Her sleep was often disturbed, during the night, by fits of suffocation, which awoke her with startings, when a slight perspiration would cover her body; she had moreover, nausea, followed by a vomiting of pituitous matter. For the last three months the belly was swollen, and the lower extremities were œdematous,

and always cold; the appetite was bad, and there was no thirst; the urine, very yellow, was secreted in small quantity; the menses had stopped for two months, the skin was cold and flabby, the pulse small, frequent, unequal, irregular, fluttering, intermittent, and impossible to describe.

The well founded suspicion of hereditary predisposition, and the pain and tumult in the region of the heart, which were the first signs of the disease; finally, the succession and the concurrence of all the other symptoms, readily pointed out to me the organ diseased and the nature of the lesion.

The patient, who was admitted into the Hospital on the 11th of October, in the most deplorable state, did not die till the 15th of November. During the thirty-five days she was in the Hospital, the anasarca several times disappeared, and all the other symptoms were diminished by the use of diuretics and antispasmodics, but they always re-appeared, shortly afterwards, with increased violence.

I opened the body, the day after she died, when the most œdematous parts were covered with ecchymoses.

The right cavity of the chest contained about six ounces of yellowish serum; the lung of that side was altered, and hardish, particularly in the inferior lobe.

The left cavity contained no fluid; the lung of that side was flabby, withered and adherent. The pericardium contained no water.

The right auricle was excessively dilated, and distended with coagulated blood; its parietes appeared much thinned; the right ven-

tricle and pulmonary artery, presented nothing remarkable; the left auricle and ventricle were of the usual size; but the aperture of communication between these two cavities, was so much contracted, by two cartilaginous pads, as not to admit the introduction of a body more than two lines thick, or six long. The surface of these two whitish cartilaginous pads was smooth.

From the experiments of *M. Sabatier* upon the cause of the inequality of the different cavities of the heart, after death, it appears demonstrated, that this inequality does not always really exist, during life, and in health, but is owing to the difficulty which the blood, brought from the different parts of the body by the venæ cavæ, experiences at the approach of death, in passing through the capillary system of the lungs, to enter into the left cavities of the heart. According to this theory, the truth of which has been proved by rigorous experiments and solid reasoning, we cannot refuse to admit, as a cause of dilatations of the cavities of the heart, and particularly of the right auricle, all diseases of the chest, whether acute or chronic. I shall prove also that, very often, when the lungs are sound, the dilatation of the right auricle, as well as that of the right ventricle, may be caused by an obstruction in the vascular system, remote from the diseased cavities.

These impediments, in general, operate nearly in the same way, that is, by opposing a resistance to the blood which it cannot overcome, and which obliges it to re-act upon the parietes of the principal agent of its impulsion. But, as I have before said, the situation of these impediments may be more or less distant from

the cavity, whose morbid enlargement they excite. I am about to mark, following the natural current of the blood, those points of the circulating system, near which, by their frequent change, the circulation is most frequently obstructed, and which, consequently, must greatly promote the formation of passive aneurism of the different cavities of the heart.

The obstacles, which usually become causes of aneurisms of the heart, I dispose in the following order.

For aneurism of the right auricle only.—Every degree of contraction, even to the imperfect obliteration of the right ventriculo-auricular aperture; a very rare organic disease.

For aneurism of the right auricle and ventricle.—The same kind of changes in the arterial pulmonary orifice, and nearly all the affections of the chest, either acute or chronic, as they all tend to obstruct, in a marked manner, the passage of the blood from the right into the left cavities of the heart.

For aneurism of the right auricle and ventricle and the left auricle.—All the degrees of contraction, even to the imperfect obliteration of the left ventriculo-auricular aperture.

For aneurism of all the cavities of the heart together or separate.—The same alterations of the mouth of the aorta, or of the aortic valves.

The obstacle which produces the passive dilatation of the right cavities, and more particularly of the auricle of the venæ cavæ, may, (following the course of the blood) be still more distant. Thus we cannot but place among the causes of aneurism of the heart, dilatations of the aorta. The co-existence of these two affections

is too frequent, to detain me, at present, in reporting cases which I shall hereafter have occasion to cite when speaking of aneurisms of this great arterial trunk. The following fact comes in aid of what I have before advanced, that an obstacle, more or less distant from the heart, is a frequent cause of the dilatation of the different cavities of that organ, and particularly of its right cavities. Here follows a striking example.

Case 24.—A lame man, aged about 36 years, died during the winter of 1798, in the Hospital of la Charité, of an aneurism of the heart, characterized by nearly all the symptoms proper to that disease. The vertebral column in this subject was so bent as to form a very acute angle to the right, towards the sixth dorsal vertebra, which was almost entirely displaced. The aorta, resting on the anterior part of the vertebra, followed exactly the turns described by the spinal column. Towards the angle, of which I have spoken, the coats of this artery were folded back upon themselves, so that the mouth of the vessel, at first turned to the right, was immediately and suddenly turned to the left. The heart was extremely large; the left cavities appeared in a good state. The extraordinary volume of the heart was entirely owing to the unusual enlargement of the right cavities, and particularly of the right auricle.

The different apertures of the cavities of the heart, and the mouths of the vessels, were free; and I do not see that this dilatation can reasonably be imputed to any other cause than the unnatural curvature of the aorta, which forced

the blood at once to take nearly a retrograde direction, thus necessarily much impeding its current and overloading the heart.

It would have been curious to compare, in this case, the pulse of the superior with that of the inferior extremities.

I know that modern physiologists have doubted whether the curvature of the arteries does retard or injure the progression of the blood; they have thought that they were authorized to conclude, from their experiments, that the effects produced by the inflexions of vessels had been much over-rated : but they have spoken only of natural curvatures, which, however, they do not consider as entirely incapable of retarding it. An unnatural curvature, such as I have been describing, has invariably a much more powerful effect; and I do not hesitate to consider it as an impediment to the circulation, great in proportion to the degree of curvature in the vessel.

There are other points of the circulating system still more remote than those already pointed out, which may powerfully influence the dilatations of the right or left cavities. I even think that general dropsical effusions, obstructions in the capillary system of the body, whether arterial or venous, caused by cuticular spasms, horripilations, fear, and many other affections of this system, arising from physical or moral causes, &c. may also be placed in the list of causes which produce these aneurisms. In a word, whether the obstacle be more or less distant from the dilated cavity, the effect resulting from it is always the same, since it is principally the accumulation of blood in the

heart which causes dilatations, and since these accumulations may arise almost as readily from a distant obstacle as from one nearer to the dilated cavity.

If to the various causes already noticed, be added the situation of the right cavities, which being more in front, are thereby rendered more liable to suffer from external violence, we shall be no longer surprized that they should be more frequently affected than the left, with the aneurism of which I am speaking.

Such are the different pathological states which favour the developement of aneurism of the right auricle. I have already remarked, that the greater number of causes which might be noticed in this article, would apply to the same affection of the three other cavities of the heart; and that the history of passive aneurism of the right ventricle and the left auricle and ventricle, would be virtually comprised in what I should say on the dilatation of the right auricle.

Section VI.

OF ANEURISM OF THE HEART, WITH DIMINISHED THICKNESS OF THE PARIETES OF THE LEFT AURICLE.

The passive dilatation of the left auricle, is much less frequent than that of the right cavities. I think I may even affirm, from the many cases I have myself seen, and from those reported by authors, that it occurs more rarely than the same affection of the aortic ventricle. This,

then, is the cavity of the heart which is least subject to passive dilatation. The cause of this does not appear to me difficult to explain.

The left auricle conveys to its corresponding ventricle the blood which it has received from the lungs, by the pulmonary veins. The blood, on quitting these veins, should seem not to be endowed with a very considerable impulsive power; now the impulsive effort of the blood upon the sides of the auricle, must be proportionate to the degree of impulsion it has received.

But ought not the blood, it may be said, impeded in its current by the contraction of the aperture of the ventricle, or by the partial obliteration of the aortic orifice, to dilate this auricle as readily as any other cavity? I think this question should be answered in the negative, and for the following reasons.

I take it for granted, that there exists a contraction at the origin of the aorta.

In this case, for the blood to act upon the parietes of the auricle, we must suppose a defect in the action of the mitral valves; for if these valves are free, the blood, stopped by their elevation, can only in part flow back into the auricle, and all the effort being made upon the parietes of the ventricle, the dilatation of this cavity will necessarily precede that of the neighbouring auricle.

If, then, we suppose the ventriculo-auricular aperture to be contracted, the passage of the blood from the auricle into the left ventricle not being free, an accumulation of this fluid in the left auricle must necessarily follow. This accumulation of blood would not be slow in producing

a dilatation, if the feeble and dilatable coats of the pulmonary veins did not offer less resistance than the muscular parietes of the auricle itself; and if the blood, in consequence of the dilatability of these vessels, had not the facility of flowing back into the vascular system of the lungs, and even into the right cavities of the heart. The left auricle then ought not to dilate, but when the resistance of its parietes is overcome by the reaction of the right cavities, and of the vascular system of the pulmonary organ. Here, however, is an example of the dilatation of the left auricle.

Case 25.—A Man, aged 38 years, of a well-marked lymphatic temperament, had experienced, for three years, numbness, throbbings of the heart, and much difficulty in breathing.

He had undergone a slight peripneumony some time before; on his convalescence from which, the above symptoms made their first appearance.

When he was admitted into the Clinical Ward, his countenance was bloated and violet; the lips were of the same colour; the region of the heart did not sound on percussion, but diffused and quick beatings were felt in it; the sense of suffocation was greater than it had ever been; the pulse soft, frequent, and irregular.

The idea of the patient, that his disorder was asthmatic, did not for a moment deceive me, and a minute examination of the symptoms, confirmed what his *facies* had before told me, that his real disease was an aneurism of the heart, of too serious a nature to admit of much

alleviation. I however applied leeches to the anus, which procured a little relief for some days; but soon the sense of suffocation, with which he had long been affected, became every instant more alarming, and finally took him off twenty days after his entrance into the Hospital. This patient, before his last breath, put his hands several times on the region of the heart, endeavouring to tear it, and scratching it with his nails.

On opening the body, I found a quantity of fluid effused in the left cavity of the chest. The lung on this side was hard, gorged, and covered with a yellowish lymphatic crust. The substance of the inferior lobe of the right lung, resembled that of the liver. One cannot but perceive in these alterations of the lungs, the marks of an ill-resolved peripneumony, and its consequences.

The volume of the heart was much augmented, and the coronary veins were gorged with blood. The left auricle, in particular, had undergone great dilatation, as well as the mouths of the pulmonary veins. The aperture of the left ventricle was rough and much contracted; its margin was of a semi-osseous, semi-cartilaginous consistence; the mitral valves were equally hardened.

In two other subjects, that were opened in the theatre of the Clinical Hospital, I have seen the parietes of the left auricle so weak and thin, that the weight of the heart was sufficient to rupture them. One of these cases will be found in the following section.

The different cases which I have cited, in giving the history of the various dilatations of the

heart, have, most of them, exhibited contractions of the orifices as causes, effects, or complications of aneurisms of every kind. I have lightly passed over the consideration of these contractions, their causes, signs, and manner of formation, because, in following the plan laid down, I shall treat of them in the class of alterations of the tendinous, or fibrous parts of the heart, which in the contractions of orifices, are the parts essentially diseased. No attentive reader will have failed to remark, in all I have hitherto written, and it will be the same in what follows, that these lesions are rarely isolated, but almost all more or less complicated with each other.

CHAPTER

CHAPTER THE THIRD.

Section I.

OF THE SIGNS OF ANEURISMS OF THE HEART IN GENERAL.

To be able to treat with clearness and precision of the signs of aneurism of the heart, it is useful, and even necessary, to consider, in the progress of this affection, several periods, marked out by the successive steps of the disease. The duration of each of these periods is, in truth, very uncertain, but still they are themselves sufficiently distinguishable by the different degrees of intensity in the symptoms, or even by the presence of some particular symptoms.* I shall then examine successively; 1st, the symptoms which indicate the existence of aneurisms in the first degree, or in their first stage. 2d, Those which announce that this disease has made some

* I know that it is not quite correct to assume that a disease like this, and many others, radically the same from the beginning to the end, except in its progression, has three distinct stages. I think, however, that I am justified in so doing, as such stages are admitted in Phthisis Pulmonalis, scurvy, &c. though not at all better marked, it being impossible, correctly, to seize their limits. The *principium*, the *incrementum*, the *status* and the *decrementum* of the ancients, the *cruditity*, the *concoction*, and the *termination* of the moderns, do not appear to me expressions more justly warranted; these divisions are of pure convenience, and the transition from the one to the other eludes observation; it is only by comparing their extremes that they can be well perceived.

progress, and reached its second stage. 3d, Those which belong to the third stage of this disease, a state in which the life of the patient is in constant danger.

The most important, and the greater number of the signs of aneurism, being derived from the consequent derangement of the primary functions of the animal economy, it is in the phenomena of these different functions, that we must seek for those signs which are the most proper to characterize this disease. After glancing at the *facies* and the general external appearance of the body, I shall successively pass in review the different states in which we find, during the course of the disease, the functions of the brain, the circulation, the respiration, the digestion, and the secretions, as far as regards serous exhalation. This methodical plan will have the double advantage of preventing, as much as possible, omissions, and of throwing more light on the diagnostic of the disease in discussion.

FIRST STAGE.

In the first stage of aneurisms of the heart in general, it is for the most part extremely difficult to recognize and clearly distinguish the signs of these affections. The experienced practitioner readily perceives the pre-disposition to the disease: he dreads and he suspects the developement of it, without being able to discriminate what is from what may be.

In consequence of an acute and prolonged moral affection, of the suppression of the menses, or of an hæmorrhoidal flux, palpitations, pains

in the region of the heart, oppression and a cough came on; can we, then, pronounce that the individual, in whom we perceive these symptoms, is affected with aneurism of the heart in the first stage? This would be to judge too inconsiderately. In fact, let the moral cause vanish, let the suppressed evacuation be promptly restored, and even the most trifling symptoms of the disease may soon disappear; as the following fact will clearly prove.

Case 28.—An Apothecary, aged 22 years, of a bilious temperament, having experienced great grief, was seized, without any other known cause, with violent palpitations, irregular beatings in the region of the heart, and extreme difficulty of breathing. The violence of the symptoms induced him to go into the Hospital of la Charité.

His face was then emaciated, and of a light yellow; his eyes were wan; his mouth was rather foul; his tongue yellow towards the root; his breathing high and very difficult. He had frequent and strong palpitations; violent and disordered pulsations were felt about the region of the heart; the pulse was hard and vibrating, but tolerably regular; the chest, however, sounded well on percussion; the right hypochondrium was somewhat painful.

The suspicion which at first arose in my mind of an organic lesion of the heart, gave place to the hope that this marked series of phenomena might be owing to a simple spasmodic affection. The comparatively recent date (five months however) of the complaint, the sensibility in the region of the liver, the general yellow tint of the whole body, contributed, not a little,

to confirm this idea; and from the second day of his coming into the Hospital, I directed a mode of treatment conformable to this view of the case. I prescribed emollient drinks, antispasmodic medicines, and baths; the patient was bled once on the fourth day. I endeavoured, by reasoning with him, to dissipate his grief, and had the satisfaction, in a short time, of seeing these means, far from being useless, as might have been expected, procuring every day a more marked relief. The cure was so rapid, that, in a fortnight from his entrance into the Hospital, this patient quitted it, in the enjoyment of a degree of health which promised not very speedily to be disturbed. May we not consider this affection as a species of nervous hypochondriasis, excited by the morbid state of the liver, and consecutively giving rise to the symptoms of disordered action of the heart, to the difficulty of breathing, &c.?

How many similar cases might be cited, taken from the great number of females affected with nervous diseases, arising from suppression of the menses, and to whom health has been restored with the restoration of this periodical evacuation! However, I will examine the different phenomena which usually accompany the first stages of aneurisms of the heart, in the order which I have laid down.

First Stage.—*External Examination.* The countenance scarcely altered, frequently presents deep but transient flushings, with a sensation of heat in the integuments. The limbs still preserve their natural and vigorous

appearance; nevertheless the patient is very easily fatigued.

Percussion of the chest gives no reason to suspect the existence of any unnatural dilatation; in a word, the sound is equally good in all the regions of the thoracic cavity; but there is often a painful sensation about the heart.

First Stage.—*Functions of the Brain.* The patient experiences frequent numbness and dazzlings; he feels as if hot vapours were mounting from the chest to the head. The pain in the head is generally frequent and obstinate. He is gloomy, impatient, and irascible.

First Stage.—*Circulation.* Palpitations, more or less strong and frequent, exist; the pulsations of the heart are felt in the usual place, and are not much diffused. The pulse is, for the most part, quite free, but often strong or weak, hard or soft, according to the species of the disease, as I shall, by and by, notice; regular, when the aneurism is simple and free from complication; irregular, and infinitely variable, when there also exist various complications and contractions, of which I shall hereafter speak. Yet this irregularity and variableness are cæteris paribus, much less than in the other stages of the disease.

First Stage.—*Respiration.* The respiration cannot be better described, than as high, short, and difficult. The least exertion causes an oppressive breathlessness; the patient, in order to breath more easily, is obliged, from time to time, to stop when walking, particularly

when going up stairs. He is remarkably liable to catarrhal complaints, evidently symptomatic, which last for several months, and much aggravate the disease; the cough, during these indispositions, being hard and dry, and often coming on by fits. The expectoration is always difficult, but not abundant; it is usually viscid, and sometimes streaked with blood. The obstinate cough, and above all the viscid nature of the expectoration, often deceive practitioners, who look upon this affection as gouty. There is almost constantly a sense of constriction about the throat.

First Stage.—*Digestion.* In the first stage of aneurism, the digestive faculties appear to have a more than natural degree of activity. Some patients are continually tormented with hunger, although they daily take a considerable quantity of food. The digestion is generally good; if indigestion occurs, it is usually occasioned by the violence or the continuance of the cough. The belly is most commonly constipated, and often for several days together.

First Stage.—*Secretions.* The natural order of the secretions does not appear to undergo much disturbance in the first stage of aneurisms. There are not then any signs of actual, but rather of threatening, serous predominance. The urine is red and deposits a bricky kind of sediment, it is natural in quantity, and it is only in the second stage that any remarkable irregularity is observed in its secretion.

These are the principal phenomena of aneurisms of the heart, in their first stage.

It may not be improper to observe, that it is my intention to speak here only of aneurisms which develop themselves slowly, and not of those which arise from violent efforts or from blows. These latter causes act very differently. They, in an instant, produce dilatation of the cavities of the organ, and the cause has scarcely existed before the disease has nearly passed through all its stages, and reached a point which continually threatens the life of the patient, although death does not usually take place till after a certain time.

In these cases, fortunately less frequent than the others, the signs which I have given, and even those which I shall give, as belonging to the second stage, are often not to be observed. Some of the signs proper to the third stage, alone display themselves; besides, they also offer this great difference, that they are less characteristic of a chronic, than of an acute disease.

SECOND STAGE.

The farther we proceed in the examination of the progress of aneurisms of the heart, the more this disease displays itself by phenomena, obvious and not to be mistaken. It is, generally, in the second stage of the disease, that patients come for assistance to hospitals. If we would see the developement of the first stage of aneurisms, we must go and seek the disease in habitations, the occupiers of which are fortunately able to take care of their health, and not obliged, by active labour, to hasten the growth of an organic affection, which then soon becomes

mortal; while, by good management, and proper attention, it might have been for a time suppressed, and perhaps, even radically cured.

SECOND STAGE.—*External Examination.* The face is already bloated, the cheeks and lips are of a deep red, approaching to violet. The general bulk of the patient is somewhat reduced. The feet and lower parts of the legs swell on standing; but this tumefaction generally goes down in the night. The chest, if there be no disease of the lungs, gives, on percussion, an equally clear sound throughout, except in the region of the heart, where it gives none, and that often even for a considerable extent.

SECOND STAGE.—*Functions of the Brain.* The numbness, of much more frequent occurrence, is sometimes followed by fainting. There is a sensation of violent constriction about the throat, which may not improperly be compared to the globus hystericus. The moment the patient endeavours to go to sleep he becomes faint. The sleep is often interrupted, during the night, by frightful dreams, which causes him to awake with starting; he is always grumbling, discontented, capricious, more and more impatient and irritated by the slightest opposition.

SECOND STAGE.—*Circulation.* The palpitations are now stronger and more frequent, without, however, according to my experience, being audible at some distance, as many old and some modern authors have asserted. The pulsations of the heart are sometimes felt to a very considerable extent, nay, oftentimes towards the

right side of the chest, and in the epigastric region, it is surely this last phenomenon that many physicians often take for the pulsations of the cœliac artery, which is, certainly, too deeply seated for its beating, hardly ever to be sensible to the touch. It is only in extraordinary, and often fugitive spasmodic affections, that, in thin people, the pulsations of this artery can be felt. Moreover, the manner of feeling, by directing the hand obliquely from the epigastrium towards the diaphragm, instead of pressing perpendicularly towards the vertebral column, readily points out the source of these pulsations. The pulsations of the carotid, and some of the deep-seated arteries of the extremities, are occasionally perceptible. Those of the carotids have often been taken for similar motions of the jugular veins.

The pulse, in active aneurism, is hard, vibrating, frequent, and sometimes contracted. In passive aneurism, on the contrary, it is soft, tolerably frequent, feeble, and easily suppressed. In both cases, it is sometimes irregular, arising for the most part, from other co-existent lesions, which may have encreased, and the influence of which, upon the pulse, I shall soon point out. At length, nasal hemorrhages often occur.

Second Stage.—*Respiration.* The act of respiration is become extremely difficult. The patient makes long inspirations, which he is obliged incessantly to repeat, because the gorged and compressed lungs can admit but little air. He cannot breath in a horizontal position, but is obliged, in order to render his breathing somewhat less difficult, to sit, bending

his body forward and supporting, as it were, his chest upon his knees. (We may make some use of this circumstance against the theory of abdominal pressure, of which I shall presently speak.) He cannot go up three or four steps at a time, without an extreme shortness of breath obliging him suddenly to stop. The cough is hard and frequent; the expectoration, in some cases, trifling, in others very abundant, according to the constitution of the patient; it is usually viscid, often bloody, and slight spittings of blood now and then take place.

SECOND STAGE.—*Digestion.* The patient feels, sometimes even pretty strongly, a desire to eat, but can hardly ever satisfy it without exposing himself to painful indigestion, even to vomitings, brought on by a violent cough, to pains in the stomach, and to greater difficulty in breathing. Some persons, however, by a singularity which I cannot explain, find relief from a full stomach, which appears to me, to act in the same manner as position does with those who are relieved by supporting the chest upon the knees. Constipation, which existed in the first stage, generally gives way to a purging, sometimes considerable, which much torments and fatigues the patient, particularly by night, from the motion which it renders necessary.

SECOND STAGE.—*Secretions.* The urine, at intervals, is scanty, which renders the situation of the patient more distressing; after some time it flows afresh, and in abundance, either by the natural efforts of the organ, or from the effects of the remedies employed; the patient

then recovers an appearance of health, which never lasts long. The serous effusion already shows itself in the extremities, particularly when he has been walking or long sitting up.

The abdominal cavity without positively appearing the seat of effusion, on touching its parietes, which seem thickened, feels soft and flaccid, announcing as it were, an approaching ascites. For the rest, the bloated countenance, the paleness, and flaccidity of the integuments of the whole body, evince a general disposition to that anasarca which soon manifests itself.

THIRD STAGE.

The collection of symptoms which the second stage of aneurisms of the heart offers, does not permit the physician to mistake the existence of this disease, but it is particularly when the aneurism has reached that stage, the principal symptoms of which I am about to point out, that he can no longer have a doubt of the nature of the complaint. Although the effects of medicine can then only be purely palliative, it is still of much importance to the credit of the physician, and to the correctness of his prognostic, as well as to his present and future mode of treating the complaint, that he should not confound it with diseases to which it has, in some respects, a resemblance. I shall treat more fully of this point of clinical medicine in another chapter. *See* section 6 of the Corollaries.

THIRD STAGE.—*External Examination.* The face in the beginning of the third stage is more bloated, more œdematous, and especially

more suffused than before. The lips, cheeks, and nose, are bluish, violet, livid; the eye-lids, swollen by the fluid effused in them, often form a kind of pad, which makes the eyes appear remarkably small. Nevertheless, it is not uncommon to see, towards the end of this stage, the puffiness of the countenance entirely disappear, leaving it of a remarkable leanness. The skin is then flabby, and shakes on the slightest motion of the head or the gentlest touch. Violet streaks are often seen, and sometimes in great number, on the sides of the chest, as well as upon the integuments of the abdomen. The parts most distant from the centre of the circulation lose their heat, even many days before death. The integuments of the chest, by their swollen and anasarcous state, render percussion of the thorax difficult; in general its results are obscure, and it can be performed to little purpose, unless practised very frequently, and with the most scrupulous attention. We readily perceive, on striking the parietes of this cavity, that a solid body renders its sound dull and obscure: thus too, we may, in some degree, measure the extent of the dilatation by the space in which the thoracic parietes produce no sound.

Third Stage.—*Functions of the Brain.* Sometimes there is delirium, particularly by night. The patient is in an indescribable state of debility, having scarcely strength enough to move his limbs. His senses are dull; he cannot enjoy a moment's repose; and he wakes with starting the moment he begins to sleep. A continual anxiety torments him to such a degree, that frequently a furious despair makes him desire and ask for

death, and even so far recover the use of his enfeebled limbs as to attempt to obtain it.

THIRD STAGE.—*Circulation.* The third stage of aneurisms of the heart is sometimes marked by the almost complete disappearance of its pulsations. On applying the hand to the region of this organ, scarcely can we feel a diffused rustling, or an obscure, deep, and indescribable tumult, in no degree resembling the ordinary pulsations; while these beatings preserve a little strength, they have an extraordinary quickness. The pulse, in almost all cases, is small, frequent, unequal, intermittent, scarcely perceptible, and often vermicular. The veins are swollen, particularly in the neck.

THIRD STAGE.—*Respiration.* The sense of suffocation is every moment more threatening. All the forced inspirations of the patient are unavailing, and the more difficult, because he has not strength enough to put himself in the position which, during the second stage, facilitates this act.

There is also a dry, convulsive-like cough. The expectorated matter, sometimes very abundant, is often bloody, or it is coagulated blood itself, having a charcoaly appearance. At other times, but less frequently, the expectoration appears as though purulent, which has caused many practitioners to lose sight of the true disease, suspecting a pulmonary affection, while the spitting is merely mucus, and owes its peculiar character to the state of the surface of the mucous membrane of the bronchiæ.

THIRD STAGE.—*Digestion.* The appe-

tite is gone; yet some patients have, at different times, a fancy to eat, which they now and then indulge so as to increase the suffocations and hasten death. The digestive powers seem to be nearly annihilated, the digestion being not at all, or but slightly performed, for after death the food is found in the stomach, nearly in the state in which it was taken, and without having undergone any change apparently belonging to the digestive process.

In some individuals, the stools are frequent and watery; while, in others, there is a constipation which does not yield to the use of clysters, or any other laxative means.

THIRD STAGE.—*Secretions.* The urine, in the course of the third stage, is thick, scanty, and deposits a sediment. Yet, as I shall observe when speaking of the treatment, it sometimes flows abundantly, and affords much relief, but it soon diminishes again, and with it vanish the improvement and vain hopes of the patient.

The serous diathesis is often at the highest pitch. The integuments of all parts of the body become distended with water. Sometimes cracks take place in the extremities, whence flows an immense quantity of water, which, for a moment, relieves the patient. During the last days of life, it is not uncommon for the external swelling partly to disappear, in which case the fluid seems to collect in larger quantities in the great cavities, and particularly in the chest.

Death always terminates the distressing spectacle which the union of all these symptoms presents. When the disease goes through all its stages, death is sometimes slow, and the

patient expires insensibly. It is, however, common for it to be preceded by slight convulsive motions. On the contrary, when the patient dies in the second stage of the disease, (an event which sometimes occurs) death is almost uniformly sudden and unexpected. In getting out of bed, in drinking, even in talking, he ceases to live; and we are often surprised to see him dead, when we had lost sight of him only for an instant.

Section II.

OF THE SIGNS PROPER TO EACH OF THE TWO SPECIES OF ANEURISM, ACTIVE AND PASSIVE.

I have said that the two species of aneurism above specified, differ much, both with respect to their nature and their symptoms. I think, therefore, I am authorised to say, that when either of these lesions exists without much complication, there are means by which it may be distinguished.

In the preceding section, I treated in detail of the signs of the different stages of aneurisms in general; in this, I shall endeavour to draw a parallel between the signs of active and passive aneurism, by which we may recognize those which belong to each of these two species of lesion.

A. A sanguineous temperament, a robust constitution, vigour of life, and a violent disposition, are the predisposing causes of aneurism of the first species.

a. A lymphatic temperament, a feeble constitution, a bad state of the humours, and a timid disposition, are the causes which predispose to the formation of aneurism of the second species.

B. Active aneurism is also generally the consequence of an acute lesion, or of one which has insensibly formed in the central organ of the circulation, excited by a violent effort, immoderate and long continued exertion, running, wrestling, venery, riding, carrying heavy burthens, the use of wind-instruments, singing, hallooing, coughing, catarrhs, pleurisy, peripneumony, &c. violent dancing, external blows, acute moral affections, succulent food, the use and abuse of wine and liquors; while in the greater number of cases a partial lesion terminates in a disease of the whole organ.

b. Passive aneurism, on the contrary, arises most frequently, at the close of chronic diseases, such, for instance, as obstructions, debility, all the moral affections of the gloomy and lowering cast, deep, concealed, and long endured grief, particularly in persons of either sex who are tender-hearted, delicate, nervous, reserved, bashful and continent, who, being perpetually agitated by these causes, are brought into a state of habitual spasm, the immediate effect of which is, to produce a permanent disturbance in the functions of the circulation and respiration. In fine, an unnatural state takes place, accompanied by weakness of the lungs, or by some slowly forming impediment in the course of the circulation. These impediments, however, sometimes give rise to active aneurism, where there is a constitutional predisposition to this disease.

C. In cases of active aneurism, the patients have a red, vultuous *(vultueuse)** countenance, and the eyes are suffused.

c. In passive aneurism, the countenance is more frequently pale and wan, though sometimes bloated and violet.

D. In the first case, the pulsations of the heart, are quick, hard, violent, and often visible. Frequently the head, the bust, the clothes are visibly moved by them, in certain positions of the body. We perceive the bed-clothes also evidently lifted up, if we notice the patient, when in bed. Whatever, in this case, may be the force with which the hand presses upon the region of the heart, it is always lifted up by the motions of that organ, which, if we can believe some authors, may be heard at a considerable distance. I have never, myself, heard these beatings far off, but by attentively listening near, I have often heard them very distinctly: my associate, M. Leroux, has lately observed the same phenomenon.

d. In the second case, the palpitations are weak, sometimes less frequent, slower, duller, and more inward, if I may so express myself. On placing the hand on the precordial region, we feel the impression of a soft body which rises up against the ribs, but does not strike them with a hard and powerful stroke, as in the first species of these affections; they appear to be

* I mean by *vultuous face*, a countenance at once red and bloated, as in inflammatory complaints in general: by *suffused (injectée) face*, a different kind of redness of the countenance, perceptible in many chronic diseases. The first appears to me to arise from an afflux of blood in the capillary arteries; the second, from a similar afflux in the capillary veins.

rendered weaker by strong pressure, while in the first kind they seem to strive against it, and to react with still greater force.

E. In active aneurism, the pulse is frequent, strong, hard and vibrating: we cannot, however forcibly the finger presses the artery, efface the caliber, or destroy its beating. We can often distinctly perceive the pulsation of the carotid, and the arteries of the extremeties.

e. In passive aneurism, the pulse is weak, more or less frequent, soft, often not very perceptible, and easily stifled, by the slightest pressure. In feeling the arteries we might say that they are as if hidden in the surrounding parts.

In both cases the pulse offers a vast number of varieties and irregularities, according to the complications of contraction, ossification, &c. and the degree and seat of these complications.

F. In the first of these diseases, percussion of the thorax produces an obscure sound through a less extended space than in the second, because this species of dilatation is generally less diffused.

f. In the second, the chest, on the left side, does not sound at all for a considerable space, because, in this case, the dilatation of the heart, whether partial or total, is always considerable, and most frequently, the serous diathesis prevailing also, there is more or less water in the left thoracic cavity, and particularly in the pericardium.

I must, however, observe here, that my readers would be deceived, if, from what I have said, they were to conclude, that passive dilatation always presents a more enlarged volume of the heart than active; sometimes in the latter it

is very great, and at least equal to what it is in the former.

These, at least according to my experience, are the principal signs by which active may be distinguished from passive aneurism of the heart. If one of these signs alone can rarely assist the practitioner, the union of several will seldom leave much doubt as to the nature of the affection.

Section III.

OF THE SIGNS BY WHICH IT MAY BE KNOWN WHAT CAVITY OF THE HEART IS AFFECTED BY ANEURISM.

We have not, it must be allowed, very certain signs which nicely distinguish an aneurism of one cavity of the heart from that of another.

We cannot admit, with *Lancisi*, as a certain sign of the dilatation of the right ventricle, the pulsation of the jugular vein, since this phenomenon has been observed in persons in whom the left cavities were found dilated; moreover, it may, as I have before observed, be confounded with that of the carotid arteries. In fact, I have often seen these arteries beat violently in aneurisms with thickened parietes of the left ventricle; these pulsations then are no more characteristic of lesion of the left cavities, than those of the jugular vein are of lesion of the right ventricle. Nevertheless, this sign, which often deserves but little attention, may, when united to many others which I am about to mention, ena-

ble us to form a pretty correct notion as to which side of the heart is affected.

The pulsations of the heart, when most evident on the right side of the chest, may also be given as signs of the dilatation of the right ventricle. But this sign, like the former, if insulated, cannot be much relied upon, because, in consequence of the unnatural size of the heart, and its change of position, (whether of the whole organ, or its apex only,) its pulsations are felt at one time in the anterior region, at another towards the right side, now in the upper, now in the lower part of the chest.

May not the constant regularity of the pulse, united, moreover, with the general signs of aneurism of the heart, be considered as an index of the dilatation of the right cavities? It may be so, provided this latter affection does not produce a derangement in the action of the left auricle and ventricle, and that the blood, finding no obstruction in these cavities, can be pushed into the arteries with the usual regularity. But this sign also is very equivocal, since the dilatation of the right cavities is frequently accompanied by a contraction of the left ventricular aperture, or that of the aorta, which always occasions an irregularity of the pulse proportionate to the degree of contraction. It must be confessed, too, that a continual regularity of pulse is extremely uncommon in confirmed dilatations of the heart, either active or passive, because they are very rarely simple, but almost always complicated with contractions, ossifications, &c. now the irregularity of the pulse proceeds and increases according to the increase of the contractions, ossifications, &c. and the dilatation follows

the same progression, with such an exact correspondence, that these three states, and the symptoms arising from them, may be said to be necessarily simultaneous.

It is in the organs which are dependent upon the two circulations that those phenomena are observed, which are best calculated to point out the particular cavities of the heart which are affected.

The lesser circulation, the pulmonary organ itself, seems to be more particularly affected in aneurism of the right ventricle; the breathlessness is in general greater, and the fainting also more frequent. The countenance is violet, and almost black, in consequence of the prolonged stay of the blood in the vena cava superior, the jugular and the facial veins, which cannot easily disgorge themselves into the right auricle. The different colour of the venous and arterial blood, very well explains the violet and almost black colour in dilatations of the right cavities, and the redder hue in the dilatation, more particularly the active, of the left ventricle.

On the contrary, in aneurisms of the left cavities, the disease appears better marked in those phenomena which are under the influence of the greater circulation. In these affections, the face is suffused, of a very lively and deep red, particularly the cheeks, while in aneurisms of the right cavities, it appears as though ecchymosed.

As soon as the disease has reached the close of the second stage, the general bloatedness comes on, whatever may be the species of aneurism. But it is more slow where the left cavities are affected; when, on the contrary, the

right cavities are dilated, the pulmonary fulness, which always exists, does not allow the blood in the lungs to be properly and fully submitted to the repairing influence of respiration. The blood then quits the lungs, and enters into the greater circulation, nearly in the same state as when it quitted it, that is to say, without having lost all which it should lose, or acquired all which it should acquire. Great must be the evils arising from such a subversion of the results of the circulation; and I am disposed to think, that this single cause may bring on more speedily the serous diathesis, in cases of dilatation of the right cavities, than in that of the left cavities of the heart, and that death, independently of this serous diathesis, may also more speedily ensue, partly in consequence of the blood having lost much of its stimulating quality.

Section IV.

OF THE TREATMENT OF ANEURISMS OF THE HEART, ACCORDING TO THE NATURE AND STAGES WHICH THEY MAY HAVE REACHED.

The different resources which medicine offers for the relief of aneurisms of the heart, cannot be employed, with equal advantage, in all the different stages of the disease, neither are they indifferently applicable to active or passive aneurism. It is under these two principal points of view, that, in the course of the present section, I

shall examine the means which the medical art furnishes for the treatment of these affections.

The first stage is that in which aneurisms of the heart can receive the most efficacious aid from medicine; because the cause then operating, may be combated with success. In the two last stages, on the contrary, we must no longer flatter ourselves with the hope of a radical cure, and palliative remedies are those alone which can be then employed.

If the chance of cure be greater or less in the different stages of the disease, much also depends upon the nature of the aneurism.

The cure of active aneurism of the heart in the first stage, appears, cæteris paribus, less difficult than that of passive. The cause of this, it is not difficult to assign; in the first case, there is excess of strength in this organ; in the second, it is in a state of remarkable weakness. A debilitating plan forms the basis of the treatment of the first species; to cure the second, we must give to the organ the strength which is naturally wanting or which it has lost. In the one case, the object is easily attained, in the other, it is, for the most part, beyond the power of medicine; it being difficult, or rather impossible, to restore to an organ, by means necessarily indirect, powers inherent in its organization, but which it has lost.

In the treatment of every species of aneurism, we should at once, if possible, attack the cause, which, when there is a chance of doing any good, will not as yet have produced all the derangement in the organ which it is capable of producing. Thus if any evacuation has been suppressed, we must restore it as speedily and

effectually as possible. If an herpetic, psoraic, gouty, or rheumatic humour has been thrown upon the heart, or its appendages, we ought immediately to employ all the means most likely to recal, the itch to the surface, the gout or rheumatism to the situation which they occupied before the metastasis, or to that which is most frequently the seat of these affections.

If what I have said on the causes of aneurisms be duly considered, it will be readily perceived, that most of them are beyond the reach of medicine. This is more especially true of moral affections. Some of these, indeed, act suddenly, and as an acute cause; such, for example, are sudden, unexpected terror, violent anger, &c. in this case, an incipient aneurism quickly takes place, or, at any rate, the patient is placed in a state so strongly disposed to the formation of this disease, that it is scarcely possible for him to escape it. How can the physician prevent the action of such a cause? How can he oppose the quick or slow developement of its effects? The inefficacy of medicine is here so evident, that it is superfluous farther to insist upon it.

The prognostic is the same in the depressing moral causes, which, from their nature, act in a slow and imperceptible manner, such are the gloomy passions, deep concentrated grief, &c.

I will suppose, then, that prolonged grief has slowly and imperceptibly produced an aneurism of the heart. Now, even if it were possible by palpitations, or any other symptoms, to know from the beginning that there existed a disposition to this disease, how could the physician remedy this ever-operating cause? Would he not

be under the painful necessity of witnessing the gradual developement of a disease which he could not prevent, because unable to remove its cause, and to which he could oppose only the ephemeral relief derived from antispasmodics, &c.

I will except some cases, the possibility of which is more in the wish and imagination than in the fact: I mean those instances in which loss of place or fortune has produced palpitations and derangements, which will soon give birth to aneurism, when some generous and powerful friends banish the cause, and the nervous state it had excited: but even this happy change can only take place where no organic lesion exists, and consequently does not well apply here; besides, it is a remedy rarely at the disposal of the physician,* although pointed out by medicine.

In the number of general causes of aneurism, there are still some which may be combated with success, particularly if application be made for relief before the disease has taken deep root.

* An anecdote, much to the point, is related of *Bouvart*, a celebrated physician of Paris, towards the close of the last century. A banker, a friend of *Bouvart's*, sent for him on account of a state of indescribable restlessness, agitation and anxiety, in which he had been for several days. The physician thought that the situation of his patient originated in some mental cause. The banker confessed to his friend, that a temporary embarrassment, and the urgent want of the sum of —— had produced his illness. *Bouvart*, on his return home, sent the sum to his friend, and thus cured his patient.

An attentive observation of a great number of diseases of the heart, points out certain avocations as remote, and even exciting causes of aneurisms. Thus, taylors are so subject to them, that it is not uncommon to see, even in those who are not afflicted with well marked organic affections of the heart, a slight disturbance in the phenomena of the circulation, which seems to be the harbinger of a more serious complaint. The advice of a physician in these and other analogous cases may much contribute to render abortive the nascent disease. In fact, what is the cause to be removed? It is to be found in the avocation of the individual, an avocation calculated to produce disorder in the action of the heart, in consequence of the impediments it throws in the way of the circulation, by the numerous curves which the ventral aorta and its branches experience from the unnatural posture which a pernicious custom has induced these persons to assume during their hours of work. The circulation is at once impeded by the inflection of the aorta, by the angle which the crural arteries make with the iliac, the popliteal with the crural, &c. The workman always sitting, with his lower extremities in a state of continual inactivity, while the upper exert wide movements, are circumstances well calculated to produce this affection, so often found among artisans of this description. There are some individuals whose vigorous organization easily surmounts causes of this nature, but there are others who, sooner or later, feel their pernicious effects. Let the latter quit their dangerous employment and soon will disappear the precursors of a disease, the serious nature of which is too

well known to warrant the slightest negligence in preventing its developement. I shall not again discuss the opinion of those modern physiologists who maintain that the curvatures of arteries do not interfere with the freedom of the circulation. The facts stated in the preceding paragraph, come in aid of what I have before said on the subject, and others might also be brought forward. Besides, there is a great difference between the natural inflections of these vessels, and the curvatures produced by the nature of a man's employment.

The business of a tailor is not the only one to which these remarks are applicable. Tanners, curriers, and washer-women continually bending forward and leaning against a plank, which places the ventral aorta in a frequent state of compression, must, from the same causes, be liable to affections of the same kind.

Both active and passive aneurism occasionally take place, in consequence of a continual state of plethora; but the same cause acts in a different manner in these two cases, and the same treatment will not produce an equally beneficial effect. The remainder of this article will explain this idea.

The powerful influence of sanguineous plethora in producing arterial aneurism, suggested to *Albertini* and *Valsalva*, the curative method known under the name of the latter, although it belongs equally to both. Every one knows that it consists in reducing the patient, by repeated bleedings and a spare diet, rigorously persevered in, to such a state of debility, that he can scarcely lift his hands out of bed. The aneurism diminishes in proportion as the patient becomes

weaker; and when there is reason to believe, from the natural contractility of the parts and from the absence of the dilating cause, that the organ has nearly recovered its primitive state, we may venture slowly to restore his strength by a more nourishing diet.

"I agreed in opinion with my friend *Valsalva*," says *Albertini*, in a paper inserted in 'The Memoirs of the Academy of Bologna,' "that the best, and perhaps the only method of curing these lesions, is that which I have been describing. *M. Valsalva* was the first who had an opportunity of trying it. The result justified our expectation, and has since been confirmed by the experience of other physicians at Bologna. These observations prove, that young persons treated in this way, before the disease had reached its last stage, have, in some instances, been cured, and in others, remarkably relieved; and that old persons, and those in whom the complaint was already far advanced, had, at least, found in this plan a more or less powerful obstacle to its progress, and a prolongation of life; provided, nevertheless, that the organic lesion had not reached that stage in which the secondary affections themselves were considerably advanced."

"Moreover, old men, in whom the disease was not too far advanced, and women of all ages, have retarded their death longer than the physician *Antipater* of whom *Galen* speaks, by a method, if not quite so severe, at least but little different from the one I have mentioned. Besides the facts which I have stated, and many others, I might quote the instance of a Knight, who, by these means, prolonged his life from 65 to 74 years; yet on opening the body, the right

auricle and the pulmonary artery were found extremely dilated; the pericardium was intimately united with the heart, and there was a dropsy of the chest."

Albertini also quotes two other similar facts.

This curative method employed with some success in arterial aneurisms, would appear, as *Albertini* has observed, in no case more rationally indicated than in that of aneurisms of the heart. The much greater contractility of the fibres of this organ, than that of the coats of arteries, gives well grounded hopes for the result of any renewed attempts; but, that it may be attended with all its advantages, we must make a proper distinction between the two species of aneurisms: now this distinction was unknown to *Albertini* and *Valsalva*.

In active aneurism, the strength of the parietes of the heart, far from being diminished, is much increased. If *Valsalva's* treatment is employed in this case, and the patient be for a considerable time kept in that state of feebleness which results from it, we can easily conceive that the fleshy parietes of this organ may assume their natural size, because their contractile power, instead of being diminished, has acquired greater energy, and I think I may conclude, that their permanent retractility, being in the same ratio, will act more powerfully as the general debility produced by the curative means shall be greater and more prolonged.

On the contrary, in passive aneurism, to produce a cure, it is necessary to restore to the muscular substance of the heart, that contracting and expanding force which appears nearly anni-

hilated. To what end, then, would *Valsalva's* treatment tend, but to fill still less and less the cavities of a muscular organ, already become almost membranous, the sides of which are consequently much thinned, and deprived of their spring? Moreover, independent of the general debility this method produces, it would tend to increase the serous diathesis, and to impoverish the blood, which would become a less and less powerful stimulant to the heart, as well as to all the other solids, organs, &c.

Active aneurism, then, appears to me, that alone in which this mode of treatment can be useful, and here only in the first stage: in the two others, a palliative treatment is all that can be employed. But as this palliative treatment is common to all diseases of the heart, which have reached an advanced stage; to avoid repetitions, I shall speak of it, only in the section on the treatment of diseases of that organ in general; although it partakes much of the character of the one I have been discussing.

A curative method which partly approaches to that of *Valsalva*, and which the illustrious *Morgagni* says he has used with some advantage, is that of diverting a certain quantity of blood from the central organ of the circulation, by often plunging the extremities, and particularly the upper, into hot water. By these means a much greater quantity of blood is solicited into the immersed limbs than naturally exists there. The heart becomes relieved in proportion as it is unloaded of blood. The palpitations become less strong and frequent; but this relief can only be momentary, and the blood artificially determined to the limb, will quit it almost as soon as

the immersion ceases. The subtraction of a due quantity of blood, by bleeding, appears to me more proper.

This method, however, is of great utility in destroying or modifying those paroxysms, of which I shall hereafter speak, which come on periodically in some diseases of the heart, and during which life is in great danger. Some cases prove that the relief obtained by this method has been much greater and more durable than could have been expected; but as no one attests a complete cure, I am induced to place it among the number of palliatives, to which I shall hereafter advert.

Whatever success we may promise ourselves from the treatment recommended by *Valsalva*, and from that advised by *Morgagni*, how difficult must it be to find patients, (ignorant of the great danger of their complaint, and therefore apt to regard such treatment as equally useless and barbarous,) who will be disposed to submit to a curative plan, the nature, duration, &c. of which are sufficient to appal the most courageous. How few cases shall we find, particularly in Hospitals, where this treatment can be adopted, since patients seldom go thither till the disease is so far advanced as to render it unavailing.

CHAPTER

CHAPTER THE FOURTH.

Section 1.

OF THE INDURATION OF THE MUSCULAR TISSUE OF THE HEART.

The induration of which I shall here speak, must not be confounded with the solidity which the heart sometimes acquires, in aneurisms of the first species. In the latter case, the fleshy fibres, although thicker and firmer, enjoy all their contractile power, while the pathological state, of which I am about to speak, is characterized by a greater or less degree of loss in their muscular contractility; besides, this state is rarely accompanied by dilatation.

I have several times observed this induration of the fleshy substance of the heart, but in different degrees. The following fact, which has already appeared in the "Journal de Medicine," (March 1801) affords the most singular instance which I have seen of this disease.

CASE 27.—A Washerwoman, aged 55, of a lymphatico-sanguineous temperament, had suffered great grief, from which time her health had become precarious. Five years after (in 1796) the menses were suppressed, and did not return till 1800. Her legs then began to swell, and the swelling gradually extended to the thighs and abdomen. The respiration became affected; a cough also came on, which, being

more violent by night than by day, deprived her of sleep. On quickening her pace, her breathing became still more difficult, and obscure pulsations were felt in the region of the heart. A diarrhœa came on, which dispersed these symptoms. It went off, and they recurred with increased violence. The patient was then obliged to keep her bed; the sleep was slight, and interrupted by frightful dreams, from which she awoke with startings.

When she came into the Clinical Ward, on the 16th of July, her pulse was small, frequent, hard, and concentrated; it presented no very great irregularity, but that disturbance so easily recognized by the experienced practitioner, and so difficult to describe. The chest, on percussion, sounded on every side, except in the region of the heart. The hand, applied on this region, was lifted up to a considerable extent. The pulsations of this organ were sometimes intermittent, and generally very irregular.

These symptoms were sufficient to point out a lesion of the organ of the circulation: the effusion in the abdomen prevented me from satisfactorily ascertaining the state of the viscera of the gastric system. I considered the disease as incurable and as likely soon to terminate in death. Diuretics and aperients were administered, with the intention of relieving the patient by diminishing, if possible, the effusion.

On the following days, the belly became more swollen, and the breathing more difficult; the patient complained of a sense of suffocation, and particularly of a fixed and insupportable pain in the epigastrium, towards the left hypochondrium: she could neither sleep nor breathe,

except when sitting upright. The anasarca increased rapidly, and extended to the chest, particularly on the right side. From the 21st, the face and upper extremities began also to be anasareous, and on the 29th the anasarca had become general; the pulse was smaller, more contracted, intermittent and irregular. This state lasted until the 14th of August, when the patient expired, after an agony, in which she screamed and struggled much.

When I opened the body, the face and head were of a violet colour; the veins of the head and neck were gorged with blood, and general anasarca prevailed. The edges of the lungs had contracted slight adhesions to the pleura and mediastinum, yet they were healthy and crepitous. There was a very small quantity of fluid effused in the cavities of the chest, chiefly on the left side.

The pericardium was remarkably large, but contained no water.

The heart was of a much larger size than usual in women of a moderate stature; it had but little fat about its basis. The blood which flowed from the cavities of the heart, on detaching it, was very fluid. The columnæ carneæ of the right ventricle, and the parietes of the right auricle, had an extraordinary consistence: the fleshy sides of both these cavities were much thicker than usual, and so firm that they supported themselves, instead of falling in, as is always the case when this ventricle is empty. All these parts were elastic; they yielded with difficulty to pressure, and immediately recovered themselves.

The left auricle was dilated, and of the same consistence as the right.

The cavity of the left ventricle appeared much distended; its sides were at least double their usual thickness; they sustained themselves like a vault, forming a fleshy box, very elastic, and sounding when struck like a kind of horn. This elasticity, and this property of sounding, were so much the more extraordinary, as the fleshy portion of the ventricle was of its proper colour, and did not appear changed into a bony, cartilaginous, or any similar substance; and yet the scalpel, in cutting it, experienced an unusual resistance, and made a singular crepitating kind of noise.

The left ventricle being dilated and thick, the pulse might have been expected to be full, hard, and strong, more particularly as all the vascular apertures were perfectly free. Nevertheless, it was small, hard, concentrated, weak, irregular, and, at times, intermittent; which is well accounted for by the elastic firmness of the left side of the heart and the septum of the ventricles, allowing only an incomplete contraction to this viscus.

There was rather an infiltration among the viscera than a complete effusion in the abdomen. The stomach was contracted. There was nothing remarkable in the rest of the abdominal viscera.

I have said that this is not the only case I had seen, but I shall not detail the others, as they offer but little difference. The parietes in none of them were quite so solid, but hard enough to resist pressure, and to make a noise under the scalpel. The symptoms of the disease, and the

characters of the pulse, were perfectly similar to those in the above case.

The causes of this affection appear the same as those which I have indicated as exciting aneurism of the first species in general, with nearly this difference however, that in active aneurism the parietes of the heart, at the same time that they become thicker, yield to the reaction of the blood, and dilate to recontract and react with a vigour proportionate to their thickness, while the induration of which I am speaking, is either accompanied by a dilatation of the cavities, or the indurated heart retains its natural size. In the first case, we may be assured, that the induration came on at some period of a pre-existing dilatation. In fact, the substance of the heart in this affection, is, to a certain degree, become solid, and consequently its power of dilatation and contraction is very imperfect; hence the pulse is small, contracted, feeble, irregular, &c.

In the second supposed case, where there is no dilatation, the induration is a primary affection, and no dilatation, for the reason I have been giving, can occur.

It is extremely difficult to say what are the signs which characterize such an affection.

In its first stage, it will probably have all the signs proper to incipient active aneurism, because, the heart at that time is thick and strong, without having as yet acquired much solidity.

In its other stages, the signs of several different kinds of lesions are found united. If, at this time, the hand be placed upon the region of the heart, obscure pulsations, as in the cited case, will sometimes be felt, at others the pulsations will be quick and violent. But these latter

can only be produced by the motions of the right auricle and ventricle, and more particularly by the more vigorous action of the left auricle, which doubtless, in this case, performs, in part, the function of the left ventricle, through which it drives the blood into the arteries. If, after this, we compare the state of the pulse, which is small, feeble, hard, and almost insensible, with the strong and tumultuous beatings of the heart, which I have observed in a similar case, they will not be found to harmonize. Should we not be led, from these phenomena, to suspect that there existed besides a dilatation of the heart, a contraction of the aortic aperture? Here error appears, in some degree, inevitable; and we must adopt the opinion which is the most plausible.

With respect to the treatment, if we could distinguish the first stage of the disease, perhaps we might succeed in preventing it, by adopting one analogous to that which I have recommended in active aneurism. But, after all, would the morbid process of nutrition which causes the induration, yield to the debilitating plan? Or is that plan likely to prevent the formation of the induration? I know too little to be able to answer these queries. However, in all cases where the disease has made some progress and is known, this plan appears, from the present state of our knowledge, to be the only one to which we can have recourse.

Section

Section II.

OF THE CONVERSION OF THE MUSCULAR TISSUE OF THE HEART INTO A CARTILAGINOUS OR OSSEOUS SUBSTANCE.

In the alteration of which I have spoken in the preceding section, the muscular substance is not, at least, to the sight, very sensibly changed in its nature. It retains its primitive appearance and colour; but this is not the case with the affection which forms the subject of the present section; although, perhaps, it may be only a more advanced stage of the former alteration. It appears, in this case, then, that the nutritive process has undergone a change in the muscular tissue; that new matter deposited in the elementary tissue of its fibres, has converted the fleshy mass into a cartilaginous or osseous substance.

I shall only cite one case of this disease from my own observation, but shall give others from different practitioners, or extracted from authors.

CASE 28.—A man, aged 64 years, had always enjoyed good health until the beginning of the summer of 1798. At this time, he was attacked with a disease of the chest, for which he was bled seven times, and which, on his recovery, left him in a state of the greatest debility.

Fourteen months after the cure of this acute disease, he was seized with difficulty of breathing, and violent stiflings, which had existed

for about two months when he came into the Hospital. Six days before his entrance, the stiflings had become so violent, that, on the slightest motion, he was in danger of suffocation. He said he had not had palpitations. His pulse, scarcely perceptible in either wrist, was small, concentrated, and irregularly intermittent; it might be said to be suspended for two or three pulsations: on placing the hand on the region of the heart, it was felt to beat with great violence, which, by no means, corresponded with the state of the pulse. The chest sounded well, except in this region and towards the posterior and right side of that cavity, which had been the seat of the peripneumony. The legs were rather clammy than œdematous. He often awoke from sleep with starting.

Though convinced of the existence of an organic lesion of the heart, I felt much difficulty in deciding upon its nature. I was most disposed to consider it as an aneurism of that organ, complicated with the contraction of some aperture.

The prognostic appeared to me of the most melancholy kind. However, diuretics procured sensible relief for two months. The breathing became easier, the pulse more free and regular, and less intermittent; but towards the beginning of April, 1800, he became worse than ever. The pulse resumed its old characters. The breathing became suffocating, and the urine less in quantity. The legs again began to swell. The œdema made an alarming progress in a short time, and the patient died without agony on the 17th of April, eighteen months after the disease of the chest, and two months after his admission into the Hospital.

At the time of opening the body, the face, and particularly the lips, were of a violet and blackish colour.

The lungs, in other respects sound, had contracted slight adhesions to the costal pleura.

The size of the heart was much greater than usual.

The right auricle and ventricle were much expanded, and their communicating aperture was evidently in a state of dilatation. The left auricle, too, was very large, and its aperture of communication dilated; the mitral valves were become cartilaginous.

The sides of the left ventricle were at least an inch thick, and very solid; the apex of the heart to a certain height and throughout its substance, was cartilaginous; the columnæ carneæ of this ventricle had also acquired a remarkable hardness approaching to that of cartilage, of which they had the physical characters.

I have nothing to add upon the causes, signs, and treatment of this affection, to what I have said on these points when treating of the induration of the muscular tissue.

In adding to the above case the facts that follow, we cannot doubt the existence, perhaps even frequent, of these very extraordinay affections; these alterations, however, appear less surprising, when we consider that the necessary action of the heart is never entirely destroyed, which would inevitably be the case, if the whole of the parietes of that organ had acquired a cartilaginous or osseous consistence.

The hardness in the case which I have cited, and in those which I shall cite, was observable at the apex, the basis, or any other part of

the heart, but in all the cases, some part or other, of more or less extent, preserved its muscular texture; and it was the action of this part alone which impelled the blood, however imperfectly, through the channels of the circulation.

The slowness and feebleness, almost approaching to annihilation, of the pulse, which existed in all the persons labouring under this affection, prove that the current of the blood, under all these circumstances, was merely slackened; for the pulsations of the heart were not and could not be quite extinct.

Here follow some cases of ossification of the heart, in support of the one I have given.

Haller says, he visited a young patient, a short time before his death, in whom he could not feel the radial arteries, although the carotids had very marked pulsations.

On opening the body the heart appeared of a natural size; but the lower part of the right ventricle, the valves of the aorta and of the pulmonary artery, and also the more fleshy parts of the left auricle, were in a state of ossification.

M. Renauldin has inserted in the "Journal de Medicine" (January 1806) a case which, from its interest, deserves to be quoted.

A student at law, of a nervous temperament and susceptible disposition, greatly devoted to study, which he would continue during the greater part of the night, living with sobriety, drinking, habitually, a great quantity of water, experienced, for two years, continual pains in the head and frequent indigestion. His breathing was constantly rather difficult. For some time

he had had, under the right jaw, a slight swelling, accompanied by acute pains, and a pulsation isochronous to that of the pulse. Soon after, he was seized with peripneumony, which yielded to a well directed treatment; but from the epoch of his recovery from this complaint, his health became daily more precarious, and at length he was obliged to take to his bed.

His countenance was pale and meagre, and his whole body much emaciated. On the slightest motion he felt strong and frequent palpitations of the heart. On applying the hand to the region of this organ, a sort of motion of the ribs was felt, and slight pressure on this part produced an acute pain which lasted much longer than the compression. Percussion here caused a very dull and obscure sound, while it was clear and natural throughout the rest of the thoracic cavity. The pulse was somewhat elevated. The patient vomited the little food he took. He complained of pain in the lower extremities, and was troubled with violent cramps in the legs and a peculiar fixed pain in the heels.

M. Renauldin recognized the existence of an organic disease of the heart. The patient died six weeks after taking to his bed.

On opening the body, the lungs appeared sound: the heart was extremely hard and heavy; when an attempt was made to cut into the left ventricle, much resistance was experienced from the total change of this fleshy part into a real petrifaction, which had, in some places, a gravelly appearance, and in others that of a saline crystalization. The sabulous grains, placed near each other, became larger towards the interior of the ventricle, and were continued

even tothe carneæ columnæ; which, themselves, petrified, had become enlarged, without changing their shape; many of them were as large as the end of the little finger, and appeared like real stalactites, placed in different directions. The whole of the ventricle was increased in thickness. The right ventricle and the large arterial trunks which rise from the heart, had undergone no change. The temporal, maxillary, and a part of the radial arteries, were ossified on every side. The brain, the viscera of the abdomen, and the vessels distributed in it were sound.

There is no instance on record of an ossification of the whole heart. It may safely be said too that none will ever occur; not that strictly speaking this ossification is impossible, but because death must take place before it can be complete; the reason is manifest.

Section III.

OF SPHACELUS OF THE EXTREMITIES, CONSIDERED AS THE EFFECT OF ANEURISMS OF THE HEART OR LARGE VESSELS.

Sphacelus of the extremities is considered by some authors as the effect of aneurisms of the heart or large vessels. The cases which they have recorded, but without drawing any pathological conclusion from them, merely show the co-existence of these diseases.

Other writers, having collected many facts of this nature, have thought proper to call the

attention of observers to this point, by advancing, that sphacelus of the extremities might be considered as the effect of disease in the principal agents of the circulation, and consequently be placed in the list of signs of these affections.

Thus, a case related by *Fabricius Hildanus*, has induced *Senac* and *Lancisi* to place this kind of sphacelus among the number of effects and signs of aneurisms of the heart and arteries which rise from it.

By the aid of physiological explanations, which are often abused, it was easy for them to account for this phenomenon; they might have said, that the circulation in this case, shackled in some way or other, even at the openings of the heart, went on but slowly and imperfectly in the vessels of the first and second order, while it was entirely destroyed in those of the capillary system; that from this cause, sphacelation of the parts most distant from the centre must arise. For the same reason, it sometimes happens, that when the circulation in a limb has been intercepted by applying a ligature on its principal artery, gangrene of the fingers or toes, or even of parts less distant from the ligature, takes place: but, although we can in a plausible manner account for a fact, we must not from thence conclude that our explanation is correct. And I still doubt, whether a sufficient number of facts be collected to enable us to pronounce with certainty on this point. I think my reserve is well founded; because, if by reasoning, we can explain the possibility of the fact, we may also prove, that however plausible the reasoning may appear, it will not apply to many

cases of this nature. In truth, in the greater number of cases which have hitherto been noticed, the organic derangement does not appear to me to have been sufficient to produce the sphacelus. For example, how can aneurism of the pulmonary artery, such as that described by *Fabricius Hildanus*, so far interrupt the circulation as to produce gangrene of the hand, when I have given, in the course of this work, twenty instances of the almost complete obliteration of the aortic orifice, without having seen in any one of them this consecutive gangrene?

However, some cases analogous to that of *Hildanus* have, it is said, occurred at the Hotel Dieu, at Paris, within a few years, to *M. Giraud*, who thinks himself warranted from them in maintaining the position, that in certain cases, gangrene of the extremities is the effect, and may be considered as one of the signs, of dilatation of the heart and large arteries. I cannot but observe, that I think this assertion rather questionable. Experience in this case, as in all others, is the only judge to which we can properly appeal. And how feeble and uncertain in his diagnostic would that physician be, who waited for the gangrene of a limb before he ventured to pronounce the existence of a dilatation of the heart. Truly, when this phenomenon appears, the disease is in its last stage, death is inevitable and at hand, and the physician ought long to have seen the nature of the affection, and to have formed his prognostic.

Here follows a summary of the cases, which have given rise to the remarks I have been making.

A female * was troubled with palpitations, frequent cough, and difficulty in breathing. After a considerable time, her left hand sphacelated. All the curative means employed, even amputation, were of no avail. On opening the body, an enormous aneurism of the pulmonary artery was found. Can inexperience and ignorance of diagnostic be carried farther than they were in this case? There is not, in the present day, a student in medicine, who has received the slightest instruction, that would not have been aware of the existence of an organic lesion of the great vessels, since, on opening the body, there appeared an *enormous aneurism* of the pulmonary artery; it must have been *enormous* to cause a gangrene of the left arm: but to recur to amputation in such a case, what a folly!

Two analogous facts, as I have before hinted, have occurred within these few years at the Hotel Dieu at Paris; they differ from the one just quoted, in the circumstance of the affection being in the heart itself, towards the apex. In one of these cases, the extreme and continual pain, which nothing alleviated, induced the surgeon, in compliance with the urgent entreaties of the patient, to perform amputation; but with no better success than in the case recorded by *Fabricius Hildanus;* death very speedily taking place, without the operation having, in the slightest degree, alleviated the pain.

We may conclude, from these cases, that sphacelus of the extremities is not a frequent

* Obs. de *Fab. de Hilden.* cent. 2, obs. 49.

consequence of diseases of the heart or great vessels; that, not to have ascertained the existence of these affections, long before the appearance of gangrene, argues a very imperfect acquaintance with them; that, to wait for the gangrene of a limb to establish the diagnostic of the disease which occasions it, is, in the case in question, a proof of unpardonable ignorance, and amputation an act of inexperienced barbarity.

Section IV.

OF APOPLEXY, AS CONNECTED WITH ANEURISMS OF THE HEART AND LARGE VESSELS.

The feebleness of the circulation, in cases of aneurism with diminished thickness of the parietes of the heart, enabled me to explain how gangrene of the extremities may be complicated, but still very rarely, with diseases of that organ. An opposite state of this function will enable me to account for the apoplexy, to which diseases of the heart and large vessels sometimes lead: a termination to which *Albertini* appears to allude, when he says, speaking of polypi, in "the Memoirs of the Institute of Bologna," that "the patients had vertigo, and sometimes attacks of an apoplectic kind, such as now and then occur in other diseases of the heart and præcordial parts."

My practice does not furnish me with a single fact of this kind, which is a little extra-

ordinary, considering the numerous cases of this disease which have fallen under my observation; but different authors will supply me with instances to fill up the vacuum. Here follows one from *Baglivi*.

The celebrated *Malpighi*, aged 66 years, long subject to palpitations of the heart, and tormented by the gout and stone, was struck with apoplexy, followed by paralysis of the whole of the right side of the body. In the space of forty days he much recovered, but with the loss of memory and reason. Scarcely had three months elapsed before a fresh attack deprived him of life in four hours.

On opening his body, the heart was found enlarged, the parietes of the left ventricle were two fingers in thickness. The right ventricle of the brain contained two pounds of blood, the left a small quantity of yellowish fluid. All the cerebral vessels were varicose. I remember that *Baglivi*, in his Treatise *de durâ Meninge*, refers the apoplexy and consequent death, to the adhesion of the *dura mater* to the cranium.* It must be recollected, that, in this Treatise he wished to prove, that the dura mater is to the circulation of the animal spirits, what the heart is to the circulation of the blood. The dura mater, according to his system, contracts itself; first, the portion

* See in *Baglivi*, page 621, *Historia morbi & sectionis cadaveris Marcelli Malpighi.* What is very uncommon and curious in this case, though foreign to the present subject, is, that the paralysis was of the right side, and the effusion in the right ventricle, while in a vast majority of cases, the paralysis is in the side opposite to that of the effusion on the brain.

known by the name of *tentorium cerebelli*, and thus alternately, &c. To what extravagances does not the rage of creating a system lead!

Another case. A man was suddenly seized with an insupportable pain in the head, and died soon after of apoplexy.

The heart was large enough to contain three pounds of blood; the aorta and the arteries of the brain were much dilated, and the brain itself was inundated with blood.

Some facts, analogous to these, may be found in the works of *Morgagni*. In his cases, and those reported by *Lieutaud*, the co-existing diseases of the heart were either of a different kind or in different stages.

Although the cases which I have just quoted are very incomplete and complicated, I am strongly induced to believe (but far from being convinced) that the disease of the heart may have been the proximate cause of the apoplexy, more particularly as it enables one to account for this phenomenon in more than one way.

In fact, apoplexy may take place; 1st, when there is a disease of the heart, with thickening of its parietes. 2d, in cases of passive aneurism, compression, contraction of a principal vessel, or from any obstruction which prevents the return of the venous blood from the upper parts into the heart.

Where apoplexy takes place in a person in whom there is excess of muscular substance and strength in the heart, it is easy to conceive that the resistance of the vessels of the brain is not in unison with the extraordinary impetus which the heart impresses on the blood; it necessarily

follows, that either the smaller vessels of the brain become more permeable to this fluid, or that they give way, and cause effusion and apoplexy.

But where it occurs, as in the second case, in consequence of the difficulty which the blood, from the cerebral vascular system, experiences in its return to the heart, from some obstruction in the circulation, things must go on very differently. In this case, the arterial system of the brain, always filling, while the venous system cannot empty itself, dilatations of the veins, perhaps even of the cerebral arteries, must consequently occur, which becoming daily more considerable, at length terminate in a rupture of one of them.

On observing with attention certain paroxysms, which take place in some diseases of the heart, one is much disposed to think that they may occasionally arise from a temporary fulness of the cerebral vessels, or of those of the lungs; these paroxysms are sometimes so intense as to assume much of the character of apoplexy. I shall speak of them hereafter.

I have said, in the beginning of this section, that I have never seen apoplectic death evidently produced by an organic lesion of the heart: I have frequently, however, seen cases of this nature, where the whole cerebral vascular system, and particularly the sinuses, were gorged with blood, but I have never seen it extravasated on the substance of the brain or in its cavities. I have also seen, in these affections, water effused in the lateral cavities, or at the base of the cranium, and have often noticed a marked effusion between the pia mater and arachnoides,

In fine, during the last hours, and sometimes days of life, persons labouring under these diseases, are in a *subapoplectic* state; among the cases which I have cited, one such may be found. In many of the others, death may be said to have been sudden; but still I cannot say that I have ever seen an instance in which apoplexy was the evident consequence of a disease of the heart.

Section V.

OF THE CONVERSION OF THE MUSCULAR TISSUE OF THE HEART INTO A FATTY SUBSTANCE.

The conversion of the muscles into a fatty substance has been pointed out by *Haller*, and many other writers, but no one has described it better than *Vicq. d'Azyr.** The subject of his case is an old man, in whom he found almost all the muscles of the leg converted into fat, so that scarcely a vestige of them remained. But, he adds, the most singular circumstance in this limb, is the disorganization of the muscular fibres, and their conversion, by insensible shades, into cellular fibres. If we examine the sartorius from its insertion with the os ilium to that with the tibia, these changes, in their successive degrees, are observable in the most striking manner; at the lower part it is so confounded with the fat surrounding the knee, that it could not be distinguished. It was not between the

* Vol. 5, M. Moreau's Edition.

layers that the fatty substance was deposited, but in the elements of the fibre itself. The limb preserved its natural shape, size, &c.

This change appears to be common to many parts which have the muscular substance for their basis. What *Vicq. d'Azyr* saw in the lower extremity of an old man, some modern anatomists have seen in the heart. Doubtless, they will some day publish these interesting facts; for myself, I have never seen this change.

I have said that this disposition to be converted into fat, is common to most muscular parts; these are the facts on which I ground my opinion.

In old people, we sometimes see the gemini converted into a fatty substance. Muscles which surround unreduced dislocations, are liable to the same change.

It is important to observe, that this morbid change does not usually deprive the muscles of all their contractile power, either because it is never quite complete, or because the muscular fibres still preserve some degree of contractility. For it has been remarked, that those old persons, in whom the gemini have been so changed, have not been deprived entirely of the power of walking; but that the strength of the muscles has been simply diminished. I doubt not that this diminution of strength is in direct proportion to the degree of change, so that the complete transformation must necessarily have brought on an entire loss of muscular power; the fact cited by *Vic. d'Azyr* is a proof of it, as the patient, in consequence of the affection, was obliged, in the latter part of his life, to walk with crutches.

I cannot say how such a transformation takes place, but will simply make some remarks, suggested by this case.

1st. The fatty nature of muscles, thus changed, cannot be doubted, because it offers the physical characters and some of the chymical properties of fat. 2d. The parts changed in the case related by *Vicq. d'Azyr*, and in other analogous cases, having preserved their natural shape and size, it cannot be said that the alteration arose from a quantity of fat forming upon those parts. 3d. The diminution of muscular power is the necessary result of, and in direct proportion, to the degree of this morbid change.

It is necessary to distinguish this morbid change from another pathological state, to which it has a considerable resemblance. I mean the state of the heart in fat people, in whom that viscus is sometimes oppressed and smothered by the immense quantity of fat with which it is enveloped on every side, particularly towards its basis.

Authors are but little acquainted with the first kind of affection of the heart; but they have given numerous examples of the last.

Kerckring relates, that in the body of an extremely fat child, the heart appeared entirely wanting, so great was the quantity of fat in which it was enveloped. This child died of suffocation.

Bonnet saw, on opening the body of a very fat man, who had died suddenly, the pericar-

dium and heart buried in an enormous quantity of fat.

I could quote many other similar examples; such is that reported by *Morgagni*, who says, in Letter 3, Article 20, that an aged man who died, after some days, of an apoplectic attack, had his heart so covered with fat, that nothing could be seen but a fatty mass. But the union of a much greater number of cases of this kind will throw but little light upon their nature, or upon the signs by which they may be known.

I do not give any case of this kind within my own knowledge; I, however, have several times seen the heart covered with a considerable bed of fat; but I dare not pronounce that this state was pathological, that is to say, carried so far as, by constantly deranging the functions of the organ, to constitute disease; though, I believe, that in all such cases, its motions must be clogged and disturbed; and I am quite convinced, that, by reason of the importance of the function diseased, they cannot be so clogged without making the health precarious, and, perhaps, seriously deranging it. I will add, that the more constant and necessary any function may be, the more dangerous is any disturbance in it. Now, no function is more necessarily permanent, none ought to be more habitually regular, than that of the heart. I am decidedly of opinion also, that when the accumulation of fat about the heart is carried to the point mentioned in these cases, it must be considered as the cause of death, and sometimes even of sudden death, as some of them seem to prove.

THIRD CLASS.

OF DISEASES OF THE TENDINOUS AND FIBROUS PARTS OF THE HEART.

General Observations.

THE nature of the internal membrane of the heart, notwithstanding the researches of *Bichat*, remains unsettled. That physiologist was disposed to think, that it had more of the character of serous membranes than of any other, but still without having a perfect resemblance to them; he also thought, that whatever was its nature, it offered in the heart with red blood, and that with black blood, differences, if not of texture, at least of properties.

On various points of the internal surface of the heart, this thin membrane adheres to, and is, as it were, confounded with the fibrous parts, or those that have a fibrous appearance. I say fibrous, or having a fibrous appearance, because anatomists are far from being agreed as to the nature of these parts. Thus, some consider the whitish bands which surround the ventriculo-auricular apertures as tendinous or fibrous, while others contend, that they are owing to the internal membrane being thickened by the addition of a certain quantity of cellular tissue. The latter allow that fibrous fibres are placed in the thick part, at the base, and particularly towards

the free edges of the valves, and between the two folds of the internal membrane. They even describe the distribution and disposition of these fibres. The former consider these valves as formed by the union of the two folds or plaits of the internal membrane, between which is interposed simply a small quantity of cellular substance which serves to unite them. All, however, appear to consider as tendinous or fibrous the little chordæ tendineæ, which, originating in the columnæ carneæ of the ventricle, are attached to the floating edges of the valves.

Without pretending to settle the doubtful opinions of anatomists upon the true nature of these parts, I shall content myself with observing, that there is no tissue of the human body more subject to become the seat of unnatural induration and ossification than the fibrous. The truth of this opinion is confirmed by the frequent cartilaginous or osseous indurations of the periosteum, of ligaments, of the dura mater, of the fibrous membrane of the spleen, &c. The serous tissue, on the contrary, scarcely ever becomes the seat of ossification. If we recollect, too, that the common diseases of the orifices, of the valves, and of the tendinous parts of the heart, consist almost exclusively of cartilaginous or osseous indurations, shall we not be warranted in considering the whitish bands which surround the apertures, the valves which appear to be almost identical with these bands, and are usually thicker towards their edges than in the middle; and in fine, the valvular tendons, as partaking more of the nature of the fibrous than the serous tissue, which is there only superseded?

The parts which have been enumerated are those which I call the tendinous and fibrous parts of the heart. But, whatever may be the exactness of this classification in using the term *fibro-serous tissue*, my object is much less to decide upon the true nature of these parts, than to afford myself the facility of uniting in one class, affections which appear to be common to the internal membrane of the heart, and some of the adjacent parts. I am not more attached to this term than to any other; but to give a certain degree of order to the division of the subjects of which I had to treat in this class, it was necessary that I should adopt some one; and I have endeavoured to use that which departs least from the results of observation.

Of all the different tissues of the heart, the sero-fibrous is, in some sort, that which becomes the most frequently diseased: not that it is subject to a greater number of different kinds of lesions, for the changes of which it appears susceptible, may all be referred to cartilaginous and osseous indurations; but that we find these indurations in almost all cases of diseases of the heart, either as causes, effects, or complications.

CHAPTER

CHAPTER THE FIRST.

Section I.

OF THE INDURATION OR OSSIFICATION OF FIBROUS PARTS IN GENERAL.

I have before observed, that fibrous parts have a singular disposition to be penetrated by those particles which constitute cartilage or bone; but notwithstanding this disposition, verified by experience, favourable circumstances, or, to speak more correctly, exciting causes are necessary to produce the ossification of the fibro-serous tissue. Whatever may be the causes which induce the vessels to deposit, in these parts, a substance different from that which, by the primary laws of their organization, they should convey; at any rate, the usual process of ossification does not appear to take place in these unnatural indurations. The cartilaginous does not succeed the mucous or mucilaginous state; and osseous solidity does not gradually supersede cartilaginous firmness: but a deposit of osseous matter takes place, entirely independent of an anterior cartilaginous state. The next paragraph will render this more clear.

Most authors, who have spoken of the ossification of the sero-fibrous parts of the heart, have given to the effects of this alteration, the denomination of *stony*; perhaps this is the most correct term for these concretions. In truth,

in natural ossification, the bony matter deposits itself in the elementary tissue even of the fibres; but it is otherwise in the unnatural ossification, which rather resembles a deposit or incrustation of calcareous matter, since it is not in the element itself of the fibres that this substance is deposited, but only in their interstices, or irregularly on their surface. Whether this ossification be external or internal, in general, its surface is lamellated, grained and uneven, resembling rather, as I have before observed, a deposit of calcareous matter, nay, often an imperfect crystallization, than a regular ossification. Probably this particular state depends upon the circumstances which attend the formation of this unnatural ossification. Phosphat of lime conveyed by the vessels, and deposited more equally and uniformly in the sero-fibrous parts, would form, without doubt, a more even, united, and regular ossification.

From what has been said, it would appear, that there are two varieties of unnatural ossification of the sero-fibrous parts of the heart, which do not differ in the nature of the substance that forms them, but solely as to the manner in which it is deposited.

The first variety consists in the incrustation of the cellular, or fibrous parts, by means of the earthy matter deposited in the interstices of their tissue. The ossification, in this case, is always covered by the internal membrane of the heart, and consequently, on opening the body, the finger cannot come into immediate contact with it.

To give an idea of the second variety, it may be said to be a kind of irregular crystallization, the unequal surface and asperities of

which, are covered by the internal membrane of the heart.

The first forms slowly, the second probably with a certain degree of rapidity, if we may judge from the sometimes quick, sometimes slow progress of those diseases, in which these ossifications are almost always found.

Section II.

OF THE INDURATION AND OSSIFICATION OF THE WHITISH BANDS WHICH SURROUND THE VENTRICULO-AURICULAR APERTURES.

FIRST.

Of Contraction of the Ventriculo-auricular Apertures in general.

The whitish zones which surround the ventriculo-auricular apertures, frequently become the seat of cartilaginous or osseous induration. Each of these states has been often observed, and I have given more than one example of them, when treating of the aneurisms of the different cavities of the heart.

The most interesting circumstance connected with these indurations, is the almost constant contraction which they occasion in the affected aperture. The manner in which this contraction is produced, is easily explained by the enlargement of the fibrous bands which surround

the apertures in consequence of the deposit of extraneous matter in them. The same cause which produces this enlargement must produce a shortening of the fibres, by separating them from each other; hence, the tightness often observed, which, added to the swelling and enlargement, the cause of which I have been pointing out, sometimes occasions an almost complete obliteration of the various apertures. I have often observed these contractions so great, that I have been astonished that the thready stream of blood which these clefts rather than apertures permitted to pass, could keep up a languishing life. Sometimes the pad which causes this contraction is even, polished, and cartilaginous, an instance of which may be seen in a model deposited in the cabinet of the "Ecole de Medicine," at Paris. In other instances, this cartilaginous or osseous pad, is covered with irregularly shaped tubercles very much resembling warts *(vegetations)*. It is not even very uncommon to find this contraction owing to a deposit of calcareous matter, irregularly placed, upon the circumference of the aperture.

In speaking of aneurisms of the heart, I placed in the number of the principal causes of these affections, the contractions of orifices, and sufficiently enlarged upon the subject to render it unnecessary for me to recur to it here. But there is one point deserving of consideration on which I have not touched; it is, whether the contractions of apertures always precede aneurisms, or whether they are not occasionally consequent to them.

I have sometimes, but very rarely, observed aneurisms of the heart without a contraction of

any of the apertures of that organ; but in these cases, the obstacle, which was the chief cause of the dilatation, must have been placed more forward in the circulation, as I have proved at some length, in the course of this work. It may be said then, with rigid truth, that a total or partial aneurism of the heart is not inseparable from a contraction of any of its apertures.

But when there is a marked contraction of one of its orifices, can the heart be free from dilatation? I think this must happen very rarely, and perhaps never when the contraction is very considerable, as then its formation, probably, is of old date, and it must have produced its effects, the principal of which, is dilatation of the heart. However we must not forget what I have before observed, that probably in some very rare cases, the ossified contractions, &c. make a rapid progress, and are carried to a high degree in a short space of time.

The distention of the right cavities, produced by the blood which accumulates in them in the last moments of life, is a phenomenon which, without being perfectly analogous to the one I have been speaking of, is in favor of the opinion which I have hazarded.

Can the contraction of an aperture of the heart take place, when active or passive aneurism exists in that organ from some other cause? I think this can very rarely happen. Perhaps a cartilaginous or osseous induration of the margin of an aperture, may take place in such a case, but then it should rather be dilated than contracted. In truth, I have several times seen an induration of the fibrous zones, where the apertures of communication which they surround were in a state

of manifest dilatation; but, as I have before intimated, it is very probable that the dilatation existed antecedently to the ossification, the developement of which must, in this as in the first case, have produced, secondarily, a contraction; while the diameter of the aperture remains still larger, than in a natural state, in consequence of the pre-existing dilatation having been considerable.*

SECOND.

Of Contraction of the left Auriculo-ventricular Aperture.

Of the two auriculo-ventricular apertures, the left is that which most frequently becomes the seat of contraction, by induration and ossification. It is that also in which these changes are found to be most complete. This is probably owing to the more decidedly marked fibrous organization of this aperture, which is thereby more disposed to cartilaginous, osseous, or stony transformation.

To the cases of more or less considerable contraction of the left aperture, already cited in different parts of this work, I will add one, which, in its progress, offers many interesting particulars.

* This assertion, which cannot be demonstrated by observation, offers, I must allow, an improper mode of expression, since it speaks of the contraction of an orifice supposed to be wider than in its natural state: nevertheless, I think I have clearly explained myself.

Case 29.—A Blacksmith, aged 20 years, of a very robust constitution and of a sanguineous temperament, came into the Hospital of la Charité on the 4th of June, 1792. He came there, he said, on account of a dysentery with which he had been attacked in the winter, and which had caused him to lose much blood by stool. He never had had any other complaint, but he was subject to nasal hæmorrhages, to which he observed all his family were liable.

For the last 10 or 11 months, he had been unable to take any violent exercise without experiencing some pain in the chest, and strong pulsations in the region of the heart. The nasal hæmorrhages had ceased for three months before he came into the hospital. The palpitations then more frequent, became also more violent, but still without being excessively distressing. He came to the Hospital for his pretended dysentery, and did not at all complain of the above mentioned symptoms, which he only acknowledged on being interrogated.

As soon as I saw the patient, I suspected an organic lesion of the heart, and two days after I announced its existence in one of my private clinical conferences. Here follows what was most remarkable.

On placing the hand on the region of the heart, strong, quick, and very irregular palpitations were felt. The patient could not lie on his back, in consequence of its producing a sense of threatening suffocation: he lay tolerably comfortably on the left side, but often awoke with startings, and said that he felt, while sleeping, violent blows on his body. The pulse was irregular, frequent, hard, weak and rebounding: it

had very irregular intermissions, and was altogether so variable, that it is difficult to convey a correct idea of it.

This disease once recognized, the intensity of the symptoms readily enabled me to point out the prognostic: it was inevitable death. I omit giving a detailed account of the treatment, which consisted in small bleedings, mild diuretics, antispasmodics and other palliatives, the inutility of which I had before pronounced.

The symptoms soon made a very rapid progress, and the patient was convinced, from his own feelings, that he carried in his breast the cause of death. The sense of suffocation, which had existed for some time, became more and more alarming, the lower extremities began to swell considerably; a violent delirium came on which lasted for near 24 hours; an excessive coldness of the limbs took place, and the patient died on the 29th of June, twenty-five days after his admission.

The body was generally œdematous. There was a slight effusion in the cavities of the chest. The lungs were sound; the pericardium contained a little water. The heart was very voluminous, and all its cavities were gorged with blood.

The right auricle and ventricle were in a natural state, except that they were enlarged, as was their aperture of communication. The left auricle was also dilated: its opening into the left ventricle was exceedingly contracted, and formed a kind of osseous slit, through which a thin coin could scarcely have passed; the part of the mitral valve which adapts itself to the orifice of the aorta, fitted but very irregularly.

The large vessels were in a natural state.

The organic derangement which I have described, was evidently the cause of the increased volume of the heart and of death.

It is clear that the disease of which the patient complained was not dysentery, but only an effect of sanguineous plethora, determined more particularly to the venous system of the lower belly. This may easily be explained; the left cavities of the heart, not properly emptying themselves, the right could not become unloaded; the blood, therefore, from the venæ cavæ accumulated; and hence arose the sanguineous distention of the liver, so frequent in diseases of the heart, as also the hypogastric venous plethora, and the intestinal hæmorrhage, but not *dysentery*.

The temperament of the patient was sanguineous to an excess; it was that of all his family; he was subject to nasal hæmorrhage; ten or eleven months before his death, he could not move without bringing on palpitations. The bleeding at the nose ceased, the palpitations increased, and the intestinal hæmorrhage came on. Is any thing more necessary to prove, that this disease was not *dysentery?* It was also unaccompanied by intestinal pains, tenesmus, or any other symptoms of this affection.

THIRD.

Of Contraction of the right Auriculo-ventricular Aperture.

The right auriculo-ventricular aperture rarely becomes the seat of cartilaginous or os-

seous induration. It is not, however, always exempt, as the celebrated *Bichat* has asserted in his "*General Anatomy.*" He observes, that from the result of all his observations, made in the Clinical Hospital of the School of Paris, the orifice of the right ventricle, the tricuspid valves, the pulmonary sigmoid valves, and even the beginning of the pulmonary artery, are never affected with cartilaginous or osseous induration. This author, at other times so prolific in excellent physiological conclusions, yielding to the desire to indicate by marked characters, a difference in the nature of the common membrane of the vascular system with red blood, and that with black blood, has gone too far on this point: he should have been satisfied with saying, conformably to truth, that this ossification had rarely been observed in these parts.

There may be seen, in the Cabinet of the School of Medicine at Paris, an extraordinary example of the cartilaginous induration of the aperture of communication, between the right auricle and ventricle. This morbid appearance, which I noticed in the Clinical Hospital, has been long modelled and deposited in that Museum. Here is another case of the same kind to which I could easily have added several more.

Case 30.—A Groom, aged 60 years, of a sanguineous temperament, had through life been subject to various affections of the chest. When admitted into the Clinical Ward, he had had a catarrh for above a year, during which time he also felt palpitations in the region of the heart, which, moreover, did not sound on per-

cussion. He came into the Hospital on the 10th of February, 1800, in so deplorable a state, that it was evident death could not be very distant. The principal symptoms were the bloatedness and violet hue of the face, lips and neck, and an extreme difficulty of breathing; the beatings of the heart were diffused and irregular; the pulse was also irregular, but not isochronous with the pulsations of the heart. The ideas of the patient soon became confused; this was followed by a lethargic drowsiness, the pulse becoming small, slow and irregular. He died three days after his entrance into the Hospital, and one year from the first appearance of the palpitations.

From the first day I had announced the nature of the disease, the inefficacy of medicine, and the approaching death of the patient.

At the time of opening the body, the face was violet and blackish; the lungs, enlarged, adhered on every side to the internal surface of the parietes of the chest. The heart was very large, chiefly owing to the great enlargement of the right auricle; the tricuspid and mitral valves were become cartilaginous, particularly at their base, which diminished the diameter of each orifice. The pericardium contained some water. The dilated aorta had some ossified points on its internal membrane.

These facts are not the only ones known. *Morgagni*, (Letter 47, Article 16,) says, that a woman, aged 40 years, had the valves of the right ventricle hardened, and semi-ossified. As for the alteration of the pulmonary artery, and its sigmoid valves, I shall presently prove that

there is no more ground for denying the ossification of these parts than of those of which I have been speaking.

Section III.

OF THE CARTILAGINOUS OR OSSEOUS INDURATION OF THE AURICULO-VENTRICULAR VALVES.

When the circumference of the different apertures is found in the pathological state, which I have been describing, it is very rare that the mitral or tricuspid valves do not partake, in a greater or less degree, of the alteration. Sometimes, also, we find these valves indurated, without the fibrous margins of the apertures having undergone the same change. There are also some cases in which the induration is not confined to the fibrous circles and valves. The chordæ tendineæ which arise from the columnæ carneæ, and are attached to the floating edges of the valves, are also apt to become ossified. Many instances of this may be found in the cases which I have cited. In one instance, the same affection extended itself still farther, as one of the principal columnæ of the left ventricle was entirely ossified, so that, in this case, the fleshy pillar, the valvular tendon, and the valve itself, formed one continued osseous body.

I have often observed the mitral valves thickened, and sometimes even in a cartilaginous or osseous state. These various states affect these membranous sails in a different manner.

When osssified, they scarcely ever form a hard, smooth, and continued substance throughout their extent ; on the contrary, they resemble a hard body, formed by the union of several indurated and ossified points : these various points are usually united by semi cartilaginous or semi-osseous layers ; the calcareous matter that forms them, seems to have been simply and unequally deposited between the two laminæ of the internal membrane of the heart, which principally composes the auriculo-ventricular valves.

The greater number of old anatomists admit that tendinous fibres enter into the composition of the valves; that they are rather irregularly distributed, but reunited in greater numbers at their base, and at those parts of their floating edges which correspond to the tendinous cords of the fleshy pillars. The unequal distribution of the phosphat of lime in cases of ossification of these parts, and the deposit which more particularly takes place at the base, and towards the edges, seem to attest the reality of this anatomical disposition, very difficult to prove by dissection.

The parts of the valves where the ancients thought they found a certain number of tendinous fibres, are those which most frequently become the seat of these incrustations. It is not, indeed, very uncommon to find, even in the middle of the valves, some hardened, cartilaginous, or osseous points; but there they are usually smaller, and it is constantly towards their base and floating edges that they are largest, best marked, and united, so as to form an unequal and often continued osseous substance.

The mitral or tricuspid valves thus hardened, may preserve nearly their natural shape and

size, or undergo a kind of retraction or shrivelling, which gives them the appearance of an unequal, semi-cartilaginous, semi-osseous pad, placed round the auricular aperture. I have frequently seen each of these states, but in all of them the valves, whether widened, or puffed and retracted, could dam up the greater part of the aperture of the ventricle. This imperfect obliteration particularly takes place, when, besides the changes I have been speaking of, the edges of the little tongues *(languettes)* which form the valves, become agglutinated together, as I have often observed.

In one of the cases in question, the union of the mitral valves, and the obliteration which ensued from it, were such, that it was hardly possible to introduce into the aperture a substance of the size of a quill. In another, the opening which remained was scarcely three lines in diameter; the blood, moreover, in passing it, was obliged to take a lateral direction, on account of its obliquity, formed by the thickened, disfigured, and united mitral valves, and resembling much the carotidian canal of the temporal artery.

I have before said, that the osseous substance is most frequently deposited between the two membranous folds which chiefly form these valves. Nevertheless, there are cases, in which, by putting the finger upon the hardened or ossified part, we come into immediate contact with little ossified points or asperities. In this case, the internal membrane, naturally little but dilatable, has been torn by the cutting edges of these points, which the contractions of the heart must make constantly to ride upon each other, or it

has been torn by the accumulation of the matter deposited between the laminæ of the valve.

The mitral valves have been much more frequently found in this pathological state than the tricuspid. But if it be unusual to meet with an ossification of the valves of the right ventricle, it does not hence follow, that we may affirm, with *Bichat*, that it never takes place.

I observed, in the section on aneurisms of the heart, that the contractions of the different apertures were frequent causes of those diseases. When I shall treat of the contractions which frequently occur at the mouth of the aorta, and sometimes at that of the pulmonary artery, I will give the signs of each.

Section IV.

OF THE CARTILAGINOUS OR OSSEOUS INDURATION OF THE SEMI-LUNAR AND SIGMOID VALVES IN GENERAL.

Of all the lesions, to which the heart is subject, the most frequent, perhaps, is the cartilaginous or osseous induration of the aortic sigmoid valves. This pathological state presents itself under different aspects. Sometimes, the induration, tolerably regular, is not accompanied by any remarkable thickening; but, most frequently, these valves undergo a considerable change of shape, from the osseous matter being irregularly deposited between the two membranous folds, which form them. It is usually

towards their base that the chief deposit of osseous matter exists. It is even very common to see this induration form a continued circle which answers to the base of all the valves: so that it would be possible, by lifting up this osseous circle, to lift up also the three altered valves. The base, however, is not the only part in which the induration and enlargement, here spoken of, may be often seen: the little tubercle, on the middle part of their free edge, acquires, in a great number of cases, a larger size than natural; or, to speak more correctly, it is replaced by a nucleus of ossification, whence the osseous induration seems to arise and extend itself throughout the whole of the floating edge of the valves, which, in this case, retract and curl up in proportion to the swelling and puffing of the edge.

Whatever portion of the sigmoid valves may have undergone this alteration, the position which they in consequence assume, is not always the same. They may either be applied against the coats of the artery, which is the most uncommon case, or they may be somewhat irregularly fallen down, which is the most frequent.

The hardened valves do not remain applied against the sides of the vessels, but when the degree of enlargement has occasioned the curling up or retraction, which I have just mentioned; in other cases they are constantly fallen down and almost immoveable.

The principal effect of each of these pathological states, is to occasion a contraction or imperfect obliteration of the mouth of the aortic or pulmonary arteries, and to produce a more or

less perceptible derangement in the pulse, or respiration.

The aortic sigmoid valves, are those which are most frequently found changed in this manner. The pulmonary sigmoid valves are much less frequently so. I have, nevertheless, observed some instances, in which this alteration was slightly visible; but *Morgagni* saw in a girl, aged 16 years, sickly from her birth, the valves of the pulmonary arteries in such a state of ossification, enlargement and union, that their edges, agglutinated together, scarcely left an opening of the size of a lentil, for the passage of the blood. This is not the only author who has observed this pathological state.

I have frequently seen contraction, or incomplete obliteration of the mouth of the aorta, but in different degrees, from the scarcely perceptible contraction, to the almost entire destruction of the opening of the vessel.

The following case is the most complete and extraordinary within my knowledge, of the contractions caused by the alteration of the semilunar valves.

Case 31.—A Washer-woman, aged 76 years, was admitted on the 14th of May, 1803, into the Clinical Ward. This woman had never had good health; at the age of 67 years, she experienced so much difficulty in walking, that she was often obliged suddenly to stop. This first symptom was accompanied by palpitations. Her complaint did not become alarming for eighteen months after. At this time her extremities were so anasarcous, that she was obliged to give up work.

When she came into the Hospital, her countenance was livid, her eyes were watery; the lower extremities, the arms, the hands, and the parietes of the abdomen, anasarcous. She had frequent nausea; her breathing was high, short, and interrupted; the palpitations were frequent; the chest, when struck, did not sound in the region of the heart; the pulse was quick, rather weak and irregular. These symptoms were sufficient to point out the organ affected, and the danger of the disease.

Thirteen days after her entrance into the Hospital, this woman, whose disease during that time had made a rapid progress, died as if suffocated.

The face, in this subject, was unequally black and livid; the brain in a healthy state; the lungs were flabby and anasarcous; and there was a small quantity of water in the two pleuras. The pericardium contained about half a pint of serum; the heart was not much enlarged beyond its natural size.

The right ventricle was soft and flabby to the touch, as it usually is. The left, on the contrary, resisted pressure, with so much force and elasticity, that its parietes immediately returned to the state in which they were before they were compressed. The substance of this ventricle was so firm, that it preserved almost a cylindrical shape. A portion of this cylinder was covered by the pericardium; and the other part, forming the septum, projected into the right ventricle, the cavity of which, it in a great degree, occupied. Its fleshy parietes were 15 lines thick.

The left ventricular aperture was studded with many sharp and osseous points, which, uniting near the septum, formed a substance of considerable size. The mitral valves were indurated only where they came into contact with the partly osseous circle of the ventricular orifice. The mouth of the aorta did not appear contracted, but the semi-lunar valves, by their arrangement, nearly closed up its area.

These valves were not only indurated and ossified, but much thickened by the calcareous matter which was deposited between the two membranous folds which form them. Their osseous hardness kept them in a sunk and immoveable state. Their free edges approached so as to touch each other, and almost entirely to obliterate the area of the vessel. Had not the base of one of these valves, although ossified and thickened, preserved sufficient pliability to perform a kind of see-saw motion, which augmented, by a line or two at most, the opening for the passage of the blood, it would have had to pass out of this ventricle by an excessively narrow slit.

The right ventricle was in a natural state. The auricles were not enlarged, but their parietes were so weak that in many places they were transparent, and tore, with the greatest ease, on separating them circularly from the base of the ventricle. All the cavities of the heart were distended with black blood, partly fluid and partly coagulated.

Here follows another instance of this kind of lesion of the semi-lunar valves, with a contraction of the left subclavian artery.

Case 32.—A Coachman, aged 48 years, robust, and of a sanguineous temperament, had had, three months before his admission into the Hospital, a violent inflammation, which was combated chiefly by bleedings. He was scarcely convalescent from this disease, when he came to the Hospital on the 28th of May, 1800. I put him into the Clinical Ward, merely in consequence of the state of his pulse, which pointed out to me an organic lesion of the heart.

In fact, the pulse was strong, full, and even hard in the right wrist; small, soft, obscure, and scarcely perceptible, in the left: irregular, *undulating* and *tremulous*, in both.

A spitting of blood came on, with a sense of threatening suffocation; his eyes were haggard; his countenance suffused; he had wandering pains in the chest, which did not sound towards the region of the heart and the lower part of the right side. The pulse remained the same.

The results of percussion, the extreme difficulty of breathing, the spitting of blood, and the characters of the pulse, enabled me to recognize the existence of hydro-thorax, which I considered to be consequent upon an organic lesion of the heart, with a contraction of the aortic orifice.

During the few days the patient was at home, he had been bled several times, and found himself relieved, but much weakened by it. An obstinate constipation rendered purgatives necessary. The œdema increased; and diuretics, aperients, and antispasmodics, afforded little relief.

He had no rest, and was obliged to sit upright night and day. When the hand pressed on the region of the heart, it endangered suffocation. He sunk under this train of symptoms on the 2d of June, 18 days after his entrance into the Hospital, and four months after the first attack of peripneumony.

On opening the body, much water was found in the right, but little in the left, cavity of the chest: the lungs were hard, and adhered to the pleura.

The pericardium contained no water; the heart was considerably enlarged; there was nothing remarkable in the right auricle and ventricle. The aperture of the left auricle, itself in a healthy state, was very large, and its valves had begun to ossify. The left ventricle was hard, thick, and very fleshy; the tendons of the valves were nearly ossified. The aortic valves were ossified and united together, so that the end of the finger could scarcely be introduced into the mouth of the aorta; this artery was dilated, rugose, and thickened to the termination of its arch. The left subclavian artery was so contracted, from about an inch from its origin, that the head of a large pin could with difficulty pass through it. This contraction arose from an osseous thickening of its coats.

This almost complete obliteration of the left subclavian artery, which I had announced during the disease, readily accounts for the scarcely perceptible pulse of that side; notwithstanding this singular circumstance, the complicated affection of the heart was sufficiently evident from the other symptoms, particularly the permanent irregularity of the pulse. The

diagnostic of the complication of hydro-thorax was also confirmed by this dissection, by which the injury which the lungs had sustained from the peripneumony was also made apparent.

When we reflect how small the aperture frequently is in these contractions, we cannot but wonder how life can go on for many years with such an organic derangement. If such an obstacle to the circulation were to form suddenly in a healthy person, speedy death would probably be the consequence; but as these affections are of slow growth, nature seems capable of accommodating herself, to a certain degree, to such a powerful impediment, gradually forming to oppose the free exercise of her laws.

The indurations of the semi-lunar valves are too numerous and various in their forms, to allow me here to describe them all. From what has been said of some, an idea may readily be formed of others. In the greater number, the internal membrane of the aorta, both above and below the valves, participates, more or less, in the principal affection. I have often seen an unequal induration extend itself even to the beginning of the aorta ascendens.

Before I speak of the signs of the contractions of the various apertures of the heart and vessels, of which I have given many examples, I think something should be said of valvular excrescences, as they often assist in obliterating these apertures, and offer different and peculiar characters with which it is necessary to be acquainted.

CHAPTER THE SECOND.

OF EXCRESCENCES *(vegetations)* OF THE AURICULO-VENTRICULAR AND SEMI-LUNAR VALVES.

By excrescences, I do not mean cartilaginous eminences or asperities, such as I have been speaking of; but real excrescences of a soft consistency, with the nature of which we should be entirely ignorant, were we not led by their resemblance to venereal warts and excrescences to suspect that they may have a syphilitic origin. For why should we hesitate to believe that the venereal virus, which disguises itself in so many forms to attack parts, which, by their situation, are protected from its immediate contact, should convey its destructive influence to the heart? Is it more difficult to imagine that venereal excrescences may form on the valves of the heart, than on the equally thin surface of the glans, of the inside of the prepuce, of the lips, of the inside of the mouth, &c. the appearance and known tissue of which have much resemblance? Besides, are not obstinate and chronic head-achs, pains in the bones and exostoses, the venereal nature and origin of which are acknowledged by all practitioners, and proved so to be by the efficacy of an antisyphilitic treatment, the effects of this poison operating upon parts situated beyond the reach of its immediate attack?

Although I have seen five other cases similar to those which I shall cite, and which come in support of this opinion, I still think I have not seen enough to justify me in speaking positively on the subject; but if we should arrive at something approaching to a certainty as to their venereal nature, and as their diagnostic can be settled to a certain point, would it not be proper to employ, in such cases, antivenereal remedies, with the hope of diminishing the symptoms, if not of obtaining a radical cure?

Under this view, it is clear, that a knowledge of the history of the private life of the patient may assist us in discovering the nature of an organic affection, and even point out the proper mode of treatment.

The best marked case of these excrescences which I have seen, has been published in the Journal of Medicine, Surgery and Pharmacy, (for October, 1800), and here are the principal features of it.

Case 33.—A Carrier, aged 39 years, of a robust constitution, but very intemperate, exposed by his occupation to the vicissitudes of heat and cold, had experienced, when 20 years old, rheumatic pains, which only momentarily interrupted his health.

In the beginning of November, 1779, he was attacked with an inflammation in the chest, which yielded apparently to a well-directed treatment; an obstinate cough, however, and some pain in the right hypochondrium, still remained; to these symptoms were soon added, a hoarseness, vomitings produced by the violence of the cough, fever by night, and finally,

swelling of the legs. Having quitted the Hospital *Cochin*, where he had been for his peripneumony, he went into the *Hotel Dieu*, which he quitted soon after to come into *la Charité*, but soon left it, and returned, for the second time, on the 9th of June, 1800.

All the animal functions were torpid; scarcely did he answer the questions put to him; his features were altered; his face looked old, pale, yellowish, and bloated, and had some red and livid streaks; the lips were suffused; he could only lie on the right side; the chest sounded rather less in the region of the heart than elsewhere; he said he had never had palpitations. The hand applied on the heart could not distinguish any confusion in the pulsations of that organ, which may be attributed to the anasarcous state of the parietes of the chest. The belly was distended and hard, and the epigastrium painful. As far as could be judged by the touch, the liver was enlarged and indurated. The legs were much swollen, and had many brown spots on them. There was a discharge of decomposed blood by the anus. The pulse was small, frequent, and irregular.

The obtuse sound in the region of the heart, the characters of the pulse, the dyspnœa, the colour of the lips, the expression of the countenance, and the sanguineous fulness of the liver, which almost always accompanies diseases of the heart, led me to suspect an organic lesion of that organ.

The prognostic was, that the patient was near his end. Medicine offered no resources. For the two first days he spat blood in small quantity; he was very weak; and on the 12th,

three days after his entrance into the Hospital, and seven months after the peripneumony, he died without agony, while asking for something to drink.

At the time of opening the body, it was yellowish, œdematous, and sprinkled with small scorbutic-like spots, such as had appeared on the legs while living; the face was suffused.

The upper part of the chest, on the right side, sounded well, but the sound was more obscure in the inferior part occupied by the liver; on the left side it was tolerably good. The region of the heart was more sonorous that it usually is where this viscus is considerably enlarged.

The parietes of the abdomen were distended by air in the intestines.

A small quantity of yellowish serum was effused in the left cavity of the chest.

The lungs were sound, crepitous, and without hardness, except in the lower part of the right lung, a very small portion of which was indurated.

The pericardium contained a little water. The heart was rather larger than usual; it had, on its anterior surface, one of the white spots before mentioned; there was another also posteriorly. Its cavities were more loaded with blood than is usual in those diseases, in which the system of the circulation has undergone no change.

The greater portion of the mitral valve which is before the orifice of the aorta, no longer adhered by the chordæ tendineæ to the columnæ carneæ, to which those cords are attached. To its edge, which was loose, hung several longish

excrescences, irregularly formed, much resembling venereal warts, and which appeared like morbid alterations of the detached chordæ tendineæ. One of the columnæ carneæ had two soft portions of its tendons visible; there were no signs of any others being torn.

One of the semi-lunar valves of the aorta had, at the middle of the surface corresponding to the axis of that artery, some hardish excrescences, much resembling those on the mitral valves.

About a square inch of the left part of the left auricle, as far as the aperture into the ventricle, was grained, and sharp to the touch, evincing a little of the morbid affection which was so considerable in the greater part of the mitral valve, as well as in one of the semi-lunar valves of the aorta. This seems to prove that the excrescences on the edge of that valve were not a simple and spontaneous morbid alteration of the ends of the torn tendinous cords, as similar excrescences were found on parts which have no such cords implanted in them. May we not even suppose that the rupture of these cords was owing entirely to the morbid change they had undergone? The liver was hard and gorged with blood; and the stomach erythematous on its internal surface.

On examining the parts of generation, well marked chancrous cicatrices were to be seen upon the margin of the glans, and one chancre even appeared not perfectly healed.

I will add another case, which proves that excrescences may form on the valves of the right cavities, (though less frequently,) as well as on those of the left.

Case 34.—A Woman, aged 23 years, had been subject from her infancy to the age of puberty, to nasal hæmorrhage and cough. She had an hemiplegia of the right side at six years of age. At 15, she was regular for the first time, but the menstrual discharge became suddenly stopped by the too hasty cooling of the body when in a state of perspiration. This brought on also an inflammation of the chest, for which numerous bleedings were used; she was, however, restored but to an imperfect state of health by this treatment. Her convalescence lasted three months, from which time until her admission into the Hospital, she had nearly a constant pain below the right breast, difficulty in breathing, continual cough, and an unfavourable expectoration. When 21 years old, she caught a gonorrhæa, for which she had used various remedies in vain, as she was still affected with it when she came into the Hospital.

A powerful mental affection, which occurred not long after a lying-in, brought on convulsions, which were with difficulty subdued by bleedings, baths, and antispasmodics. On this occasion the menses were again suppressed; stiflings and palpitations took place; the body lost all its plumpness; and the countenance, before florid, became pale and livid. These symptoms gradually increased; and when she came into the Hospital, she had also a burning heat in the palms of her hands, a continual pain in the forehead, and an anxiety difficult to describe. She frequently awoke with startings; tumultuous and irregular motions were felt in the region of the heart; on blowing her nose, blood continually came away; she vomited her

food, and was obliged to sit upright in her bed, with the body leaning forward. The pulse, during the whole time she was in the Hospital, was intermittent, unequal, irregular, at times tumultuous, and not to be described.

The character of the disease was clear; the symptoms left no doubt upon my mind as to the nature of the lesion. The prognostic was hopeless; yet during the first days she was in the Hospital, she experienced a transient amendment.

The disease became every moment more serious, and terminated in death, a fortnight after her entrance into the Hospital.

The body when opened, appeared very emaciated, notwithstanding there was slight œdema. The face was blue and thin. On percussion, the chest sounded tolerably well on every side. The right lung slightly adhered to the pleura; its substance, in consequence of the peripneumony, was hardened, gorged, and resembled that of the liver; there were several tubercles in it. The left lung was not so much diseased as the right.

The heart did not appear larger than natural, and adhered to the pericardium nearly throughout its extent; these adhesions were strongest towards its fore part, and a little above the apex. None of its cavities were dilated.

The left auriculo-ventricular aperture was contracted, hard, and cartilaginous. The mitral and aortic semi-lunar valves were studded with excrescences, resembling those which are sometimes found on the glans and prepuce of persons affected with syphilis.

The right auriculo-ventricular aperture was not contracted; but its valves, as well as the pulmonary sigmoid, were as much covered with excrescences as the corresponding parts in the opposite side of the heart.

I have had several opportunities of observing excrescences on the aortic and pulmonary semi-lunar valves, similar to those which I have noticed on the valves of the ventricles. To the two cases already cited, of excrescences on those parts, I add the two following.

Case 35.—A Water-carrier, aged 33 years, came on the 11th of July, 1797, into the Hospital; he had long been subject to attacks of palpitation and suffocation, which came on particularly on riding or walking fast, but for the last week these symptoms had assumed so alarming a character that he was in continual danger of being suffocated.

On the day of his admission, his countenance was much changed; his legs, feet and hands, were anasarcous; the difficulty of breathing was excessive; the cough harassing, with an abundant expectoration of mucus; the pulsations of the heart were tumultuous; and percussion produced no sound in the region of that organ. The pulse was frequent, rather hard, unequal, and very irregular.

This patient sunk under his disease, after remaining five days in the Hospital, in a state of extreme anxiety.

On opening the chest, I found the heart enormously large. The apertures of communication between the auricles and ventricles appeared dilated. The aortic semi-lunar valves

were fringed, as if corroded, and studded with excrescences resembling venereal warts. The lungs were sound, and the chest contained but little water.

Case 36.—In another subject, who died from a disease of the heart, I had an opportunity of seeing the three semi-lunar valves united so as to form but one. Some excrescences, similar to those of which I have just spoken, were to be seen on the loose edge of this valve.

SUPERNUMERARY SECTION.

Of the Signs proper to the Contractions of Orifices.

The cartilaginous or osseous induration of the auriculo-ventricular apertures, of the mitral, tricuspid, and semi-lunar valves, and the excrescences which grow upon these valves, for the most part tend to produce a greater or less degree of contraction in the affected openings.

When these contractions exist, the phenomena of the circulation are exceedingly deranged. It is by consulting this disturbance in the circulation that the physician will discover the certain signs of this class of diseases.

To be able to mark these signs with precision, it is necessary to establish a distinction between the different affections of which I have been speaking. 1st, Those which produce an incomplete but permanent and always uniform diminution of the area of the orifices. 2d, Those which produce this diminution only at intervals.

Among the former should be placed the indurations and ossifications of the ventricular circles and valves; because the effects of this permanent pathological state are always the same, and remain constantly perceptible to the practitioner.

In the latter, we must place those excrescences which are found on the ventricular and sigmoid valves; which operate only by intervals, and when these bodies, almost constantly floating in the cavity of the ventricle or vessel, present themselves, more or less frequently or unequally, at the orifice on the edge of which their base is fixed.

The signs of these contractions are obscure, in proportion to the distance of the contracted parts from the origin of the general arterial system; because it is upon an attentive consideration of the derangements which take place in this system, that our knowledge of these signs is founded. I will explain myself; it appears to me very difficult to recognize the contractions which occur from the ossifications of the circumferences of the orifices or valves of the right side of the heart, as well as of the pulmonary artery. Where shall we find the precise signs by which to recognize them? The regular or disordered action of the right cavities of the heart can only be perceptible in those organs which are under the influence of the lesser circulation; as the disturbance in the action of the left side of the heart is alone to be discovered by the phenomena of the greater circulation.

If we could investigate the pulsations of the pulmonary artery or its ramifications, as we can

examine those of the aorta or its branches, we should distinguish as readily contractions of the apertures of the right as those of the left side of the heart; but this is impossible, and we are reduced, in this case, to examine the action of the pulmonary organs by the phenomena of respiration. How then is it possible to know, or shall we ever know, what disturbance or modification of respiration takes place when the lungs receive a less quantity of blood than usual, in consequence of a contraction in the ventricular aperture of the right side of the heart, or in the mouth of the pulmonary artery? We may readily conclude, that a particular modification of the act of breathing should furnish those signs. But this modification is not sufficiently prominent and decided, or rather we are not gifted with sufficient penetration to distinguish it, from the great number of others which this function experiences in the various affections of the lungs. May not an irregularity in the act of respiration, which is increased by the slightest motion, even by the slightest moral impression, &c. in a person who is neither asthmatic or nervous, added to a continual sense of oppression, be considered as pathognomonic signs of this lesion of the right side of the heart? I strongly suspect, but dare not affirm, that they may.

If we cannot discover the signs of a contraction of the right orifices of the heart in the organs submitted to the venous circulation, or that with black blood, can we hope to meet with them in the alteration of the phenomena of the greater circulation? The influence of the one upon the other is such, that it is impossible that either should be deranged without the other

undergoing some kind of disturbance. But what is the particular nature of this disturbance? I much doubt if the nicest observation can supply the practitioner with a diagnostic sufficiently subtle to mark the change of these orifices by the simple disturbance of the respiration, if it be not assisted by all the co-existing signs.

Reasoning from physiological laws, it might perhaps be said, that the small quantity of blood, sent through the right cavities of the heart into the lungs, and from thence into the left cavities, fills and stimulates them imperfectly, which renders the pulse weak, soft and slow. But in this case, as in many others, to what gross errors will the individual be exposed, who attempts to subject morbific phenomena to the theories of physiology, and who expects to find in these theories, too often hypothetical, the knowledge of the signs which characterize peculiar diseases! How frequently would clinical observation destroy these theoretic speculations, as it will sooner or later overturn so many of those, the foundation of which is merely a spirit of innovation!

The union of a great number of symptoms is necessary to clear up the diagnostic of the contraction of the right orifices; the almost ecchymosed colour of the countenance, the marked fulness of the general venous system, and of that of the liver in particular, the increased volume of this organ, the great degree of breathlessness, its longer standing, and, in fine, all the other signs which point out an affection of the right cavities, usually dilated in consequence of these contractions, must be added to the character of the pulse, which, in this case, is

less irregular than in that of the contraction of the left orifices, but less regular, notwithstanding, than in a natural state.

The obscurity which envelops the signs of the contractions of the right orifices, is not entirely removed from those which characterize the imperfect obliteration of the left auriculo-ventricular aperture. However, besides the general symptoms of diseases of the heart, which are constantly found in this as in the other case, because it is almost always complicated with aneurism; some particular signs may enable us to recognize the complaint in question.

In this number, is a particular rustling, difficult to describe, perceptible to the hand when placed on the præcordial region, and which, doubtless, proceeds from the difficulty which the blood experiences in passing through an aperture, no longer proportionate to the quantity of fluid to which it has to give vent. The pulse, likewise, presents this rustling, but much less distinctly. Furthermore, this is not the only character by which the pulse announces the existence of a contraction of the left aperture, for it is less regular than in cases of contraction of the right apertures, but more so than when the aortic orifice is altered; it is moreover deficient in strength, hardness and fulness, because the quantity of blood which the left ventricle pushes forward is proportionate to that which it receives from the auricle, which is incapable of completely emptying itself.

Notwithstanding this defect in the excitement of the left ventricle, we must not expect that in these cases the pulsations and palpitations of the heart will be always weak and indistinct.

The right cavities, and particularly the left auricle, frequently acquire a thickness and strength which render its contractions very distinct: they may even, in this case, become more violent than under any other circumstance, since the beatings of the heart depend upon the movements of the auricles which push this organ forward, and the force of these movements increases, generally, in proportion to the difficulty which they experience in propelling the blood through their contracted orifices.

When the induration, or ossified aortic semilunar valves, dam up a portion of the aorta, the obstacle which they produce, breaks the flow of blood, propelled by the heart into this artery; strong and frequent palpitations take place, because the heart fills itself with ease, but empties itself with difficulty; hence result the protracted stay of the blood in the left cavities, and the irritation excited by the more prolonged application of its stimulating power to the parietes of that organ. The pulse may preserve, in this case, a certain degree of hardness or stiffness, but never much fulness or regularity. This constant and permanent irregularity, often augmented by the force and frequency of the palpitations, will always suffice to establish the precise diagnostic of a contraction of the aortic orifice, or of an alteration of its valves. Here there is no obscurity; by habit and attention the physician may always pronounce with confidence, for when he has, as guides, this kind of undulation, this rustling, this obscure trembling of the pulse, his diagnostic needs not to be uncertain.

To conclude what I have to say upon the signs of contractions, I must speak of those cases in which a greater or less obliteration of the orifice is momentarily produced by the presence of an excrescence, wart, or polypous concretion.

When these excrescences are found attached to the mitral valves, they are attended by all the signs proper to the contraction of the left auricular aperture, with nearly this difference, that the greater part of these signs are only produced after longer or shorter intervals.

When, during the contractions of the left ventricle, these appendages, always floating at the aortic orifice, are applied against the sides of this vessel, their effects are nearly the same as those produced by the simple ossification of the semilunar valves of the aorta, and the contraction that this ossification causes in the area of the vessels; but if these excrescences, from their own weight or any other cause, lower the valves, and present themselves at the aortic aperture, during even the contraction of the ventricle, it is evident that a momentary and almost total obliteration of the area of the aorta will ensue. This for some moments partially suspends the flow of blood; hence originate the successive regular and irregular state of the pulse, and the frequent and incomplete faintings: this momentary interruption of the circulation, forces the heart to redouble its efforts to overcome the obstacle opposed to it; hence the reiterated pulsations and violent palpitations of this organ, which cease as soon as the obstacle ceases, and are renewed the moment it is re-produced; hence also the impossibility, sometimes for a

good while, of feeling the pulse, when in a moment after, its pulsations return with force, vivacity, and momentary frequency and irregularity.

I have said nothing of the signs of excrescences of the pulmonary, tricuspid, and sigmoid valves, because I have had but few opportunities of seeing them. I believe, moreover, as I have before observed, that even if this pathological state were more frequent, it would be as difficult to point out the signs of it as it is to distinguish the contractions of the orifices of the right from those of the left cavities.

FOURTH

FOURTH CLASS.

OF DISEASES WHICH AFFECT AT THE SAME TIME SEVERAL TISSUES OF THE HEART.

Section I.

OF CARDITIS.

Carditis is placed in some works among the phlegmasiæ of the muscles. I have ranged it in the present class, because I think, contrary to the opinion of some authors, that this disease is not exclusively confined to one of the tissues which compose the heart, but that it affects, in an equally marked degree, the muscular, serous, and cellular tissues, and I do not even except the vascular tissue of that organ. Perhaps, if I were called upon to declare which of these tissues were the most affected, I should say the cellular. I shall have an opportunity, at the close of this section, of supporting this opinion by some facts in pathological anatomy, which have fallen under my own observation, and by others which I have extracted from authors.

Few diseases of the heart are less known than carditis. If we endeavour to determine which is the affected tissue, or to distinguish this affection from many others with which it may be confounded, as pericarditis for instance, we are arrested by the obscurity which covers the discussion of these inquiries.

The serous membranes are in general so intimately united to the organs which they cover, that their diseases almost always affect the substance of the organs themselves, and vice versa. In fact, can pleurisy pass through its course without the substance of the different tissues of the lungs partaking more or less of the inflammation? This must be exceedingly rare; for where we have an opportunity of examining the dead subject, we always find that the disease has, more or less, extended to the pulmonary substance. Even in the event of cure, still something of this kind may be suspected. In inflammation of the bowels, is the inflammation confined to the serous membranes alone, or does it not extend to the other coats and the ambient cellular membrane? This isolation of the affection of different tissues has, in our days, been pushed much too far; the idea may be excellent in theory, and even useful in the study of medicine, but is injurious in practice. It is very necessary that these general propositions or rules should be brought to the test of observation.

Before I bring forward cases of this disease, I cannot elude a question which I have often proposed to myself in the course of my practice, and which a sufficient number of facts has not as yet enabled me to solve. Has inflammation of the heart always a well-marked acute character, or is it not sometimes so obscure and insidious in its progress, that it becomes exceedingly difficult, if not impossible, to recognize it? I have before said, that I have not seen a sufficient number of cases to enable me to answer either of these questions. How-

ever, if the disease always preserved an acute character, how did it happen, in the cases I am about to detail, where it was impossible to establish the diagnostic, that, on dissection, the heart was found in a morbid state, denoting previous inflammation, though the disease, in its progress, had offered none of the symptoms proper to *carditis?* I will give three of the cases, which have excited this doubt in my mind, and, contenting myself with pointing out these facts, shall leave to future observers the task of confirming or rectifying them. I think the facts which I have to bring forward, will induce physicians to agree with me in considering as extremely important the division of carditis into occult and manifest: let me adduce a few cases of occult carditis.

Cases 37.—A Cleaner of Shoes, aged 67 years, of a sanguineous temperament, had for thirty years been subject to a distressing dyspnœa, and frequent colds, but had never felt palpitations.

On the 24th of April, 1803, the breathing being more than usually difficult, he felt a slight pain in the middle and interior part of the left side of the chest; two days after he spat blood, and on the 29th was admitted into the Clinical Ward. He had then a little pain in his head; his countenance was animated; his eyes brilliant; his tongue whitish; the breathing a little difficult, with wandering pains in the chest, but no palpitations. His pulse was weak, irregular, intermittent, and not the same in each wrist. On the following day, the respiration was more difficult, noisy, and rattling; the pain

in the chest had greatly increased ; he had delirium, and talked much. In the morning he got up several times to the window to breathe ; he did the same at mid-day, lay down and died unexpectedly on the 7th day of the disease.

The pain in the chest, the difficulty in breathing, and the external examination, had, from the second day, convinced me of the existence of peripneumony ; the brilliant eye, the talkativeness, the seat of the pain, and the characters of the pulse, indicated to me, that the inflammation had extended to the heart, without leading me to suspect any particular derangement in the texture of that organ.

At the time of opening the body, the countenance was unequally livid and violet, and the subcutaneous veins were gorged with blood. The brain was in a good state.

The right lung, throughout adherent to the pleura, was flabby, very extensible and œdematous. The left lung was covered throughout a great part of its surface, particularly near the pericardium, with a pseudo-membranous crust several lines thick. The costal pleura of this side appeared to have been the seat of inflammation.

The pericardium contained about a pint of a purulent and flaky fluid ; its internal surface was covered with a membranous-like substance, the superficies of which had numerous elevated points upon it.

The heart, of the natural size, was soft and flabby. The fleshy parietes of the ventricles and auricles were of a pale yellow ; a fatty substance might be said to be deposited between their fleshy fibres, which seemed separated from

each other. A vascular kind of net-work was perceptible upon the surface, and even on the interior substance of the fleshy parietes of the heart. By gently pressing the fleshy substance between the fingers, it was easily reduced to the consistence of a pap, and of a dull pale colour. All the cavities of the heart contained polypiform concretions, which extended even into the cavities of the vessels.

The abdominal viscera were all sound.

To this fact, and which I will call obscure acute carditis, I will add two others perfectly analogous, and in which the diagnostic was as obscure as the pathological state was evident on opening the body.

Case 38.—A young Person came into the Clinical Ward, labouring under a disease of the chest, with a pale and wan countenance, and œdematous legs; she coughed much, and had a puriform expectoration. Finding little relief from the medicines which she took, she quitted the Hospital.

She soon returned, and the same means were again employed, as I still entertained the idea that it was a pulmonary affection: but on a more careful examination, I observed that she had constantly a small pulse; and the lips being bloated and violet, a symptom not common in pure phthisis, I used percussion with more care, and found that the chest, which sounded well on the right side, gave no sound on the left. This, and several other symptoms, made me think that the left cavity was full of liquid. The belly was so distended with water, that I ordered paracen-

tesis, which gave vent to a considerable quantity ; but the patient died in a few days.

On opening the body, the pericardium was distended with a purulent fluid. The surface of the heart was covered with a layer of lymphatic matter ; the heart itself was small, contracted, soft and pale, even in the interior of its substance. The interior surface of the pleura was only affected on the right side.

Case 39.—A Woman was received into the Clinical Ward. She had ascites, for which she received the usual treatment ; was tapped several times, without finding more relief than is usually experienced in similar cases. Although the symptoms were exceedingly obscure, I had an idea that they might arise from an affection of the heart. The smallness, weakness, irregularity and peculiarity of the pulse, gave rise to this idea. This patient died ; and I found, on opening the body, the pericardium much distended with a lactescent and puriform liquid. The heart was whitish, small, as if retracted, without consistence, and quite misshapen. The auricles, ventricles, and great vessels, were surrounded by a white lymphatic substance.

This woman had been ill for seven or eight months ; but the true nature of her complaint had never been suspected : yet the appearances, on opening the body, left no doubt of the early existence of carditis, which had degenerated into chronic inflammation of the heart, the symptoms of which were obscured by the dropsy, consecutive, doubtless, upon the affection of that organ.

These two cases, in my opinion, incontestibly prove the propriety of the division into occult and manifest carditis, a division which also permits a subdivision into occult acute, and occult chronic, carditis. The first of these three cases, is an instance of the former, as the patient died on the seventh day, we must not, however, forget that he had been in ill health for thirty years: the two last are instances of the latter.

I do not recollect having seen in the course of my practice, acute carditis without complication, as described by several authors, and which, according to their account, is accompanied by peculiar symptoms by which it may be recognized. But to complete the brief history of this inflammation, I will give some cases which will display the particular characters of this disease.

Meckel gives (in a paper inserted in the Memoirs of the Academy of Berlin) the following facts;

Occult Carditis.—In dissecting a robust young Man, aged 26 years, who had died suddenly, without any previous pain, and whose body, in a few days after death, was in a very advanced state of putrefaction, he found the pericardium full of white pus; the heart corroded by suppuration, and surrounded by much soft fat, in a state of inflammation. The muscular substance of the two ventricles was extremely relaxed and deficient in blood; this fluid, in the veins of the body, was broken down; the aorta contained a white and polypous-like concretion.

A robust old man, 64 years of age, who had been a great wine-drinker, complained, some days before his death, of great pain, which took place without being preceded by any other symptoms. On opening the body the pericardium contained about two pounds of white pus, and the heart itself was covered with a purulent and tenacious coat, two lines thick, under which it was corroded and inflamed. This organ was entirely surrounded by fat, reddened by the inflammation; it was pale in its muscular substance, but all its cavities were filled with thick and coagulated blood, except the left ventricle, which contained only a small white polypous concretion. These facts, which the authority of the reporter does not permit us to doubt, extraordinary as they are, are striking examples of occult acute carditis.

Instances of acute inflammation of the heart. In the body of a man, aged 50 years, who died of carditis, the same author saw a great quantity of pus in the pericardium, and a purulent plaster-like substance covering that viscus. Under this purulent coat the muscular fibres were, in some places, quite visible, and at these points the substance of the heart was rough; its external membrane was wanting, having been destroyed by the suppuration, so that the pus coming into immediate contact with the muscular fibres, and penetrating through the cellular tissue, had given them a white appearance. The auricles were plastered with a great quantity of thick pus, and the inflamed vessels gave them a very lively red, particularly the right, which was considerably dilated, while the left was flabby

and paler. This may be considered as a case of manifest acute carditis, according to the words of the author, who says: *Death, in consequence of inflammation of the heart.*

Among the cases of manifest acute carditis, tolerably well marked, may be placed those which follow.

The same *Meckel* reports, in the work before cited, that a robust young man, aged 22 years, felt an acute pain in the region of the heart, which prevented him from following his usual occupations. Fever came on, accompanied by a hard and frequent pulse. His complaint had existed a fortnight, when he came into the Hospital in consequence of finding no relief from the frequent bleedings, &c. which had been employed: the symptoms, however, diminished a little, but in a short time the agonizing pains again recurred, and increased until his death, which took place on the 6th day from his admission, and the 20th of his disease: he died complaining continually of poignant pains in the region of the heart.

On opening the body, the abdominal viscera were perfectly sound, and the lungs gorged with blood: the pericardium was inflamed and contained a yellow and thick pus, which had caused slight adhesion of this membrane to the heart. The surface of that organ was covered by a lymphatic crust, which it was difficult to detach from it. This crust, being carefully lifted up, the fleshy fibres were found to be covered and concealed by a quantity of fat. The surface of the heart was uneven, and its vessels inflamed and besmeared with pus, had formed a reddish

net-work. The muscular fibres carefully separated from the fat, appeared paler even into the cavity of the ventricles, without the slightest inflammation, or vestige of pus, so that the texture was loose, rather than firm, or in a state of contraction. This is evidently a case of manifest sub-acute carditis, for its progress and duration do not warrant its being placed in the class of highly acute. This dissection confirms what I have advanced, that in inflammation of the heart, all the tissues, and frequently even its vessels, are affected.

A Woman, aged 24 years, according to *Storck*, having gone out of a very hot place into the cold, was seized with shiverings, very acute pain in the left side, great heat and general indisposition. To these first symptoms were soon added, difficulty of breathing, palpitations of the heart, and an inexpressible heat in the left side of the chest. At the same time, the strength failed, the pulse became very small, and the extremities cold; soon after great anguish, faintings, and finally death occurred on the 6th day.

The body was opened, and the lungs were found red, gorged, and in a state of inflammation: the interior surface of the pericardium corroded, or ulcerated: this membranous bag was distended with thin pus. Suppuration had taken place, even very deeply, in the interior part of the heart: the basis of this organ, was nearly in a state of gangrene: the beginning of the aorta, for about an inch, was also in a state of suppuration.

Manifest sub-acute carditis.—We read in *Fabricius Hildanus*, that a Man, 45 years old, complained of a heavy fixed pain in a part of the chest, accompanied by a sense of compression upon the heart, and difficulty of breathing. These symptoms having continued for some days, he appeared better; but soon an ardent fever with dyspnœa, delirium, and continual watchfulness came on; the faintings rapidly succeeding each other, the patient died on the eleventh day.

On opening the body, the pericardium was found filled with a great quantity of pus in which the heart was immersed. This organ itself appeared half destroyed, half corrupted. The lungs had undergone a similar alteration. This is clearly an instance of manifest sub-acute carditis, but one cannot but remark the vague expressions, *half-destroyed, half-corrupted.*

I could enumerate many more cases of this sort, but the foregoing appear to me sufficient to support my propositions, which will be still more confirmed when I come to speak of the different terminations of inflammation of the heart.

From the three cases which have fallen under my observation, and from those which have been cited, I think I may venture to draw this inference, that the pathological state of the heart, in those individuals who have died in consequence of acute or chronic inflammation of that organ, has particular characters which it will not be useless to trace, as facts of pathological anatomy.

In carditis, the serous tissue of the heart seems to undergo the same inflammation as in *pericarditis*. As to the inflammation of the muscular tissue, it would appear from the cited cases, to be at length changed by it into a soft and pale substance; the fleshy fibres preserving but little tenacity, and the cellular tissue which unites them, appearing also loose. Sometimes it is penetrated by a lymphatic purulent matter: in some instances it is in part destroyed; the vascular system is more visible, more developed than in a natural state, and seems to partake of the inflammation of the other tissues. On viewing the whole heart deprived of its pericardium, its surface has the appearance of pale yellow fat, sometimes a little livid. This fatty-like substance seems to fill up the interstices of the muscular fibres, which are, in general, not very apparent, on account of their tenuity and paleness. Perhaps this state, superficially examined, has been sometimes taken for the conversion of the heart into fat. Its parietes are easily torn, and it is not necessary to press them hard to reduce them to a state of thick pap.

Its cavities are almost always, in this case, filled with coagula. Solid branches of these clots are extended even into the great vessels. The formation of these polypi-form concretions is easily explained, when we consider that the alteration in the parietes of the heart so much diminishes its force of action, that in the last days of life it cannot unload itself of all the blood which the veins pour into it.

If the serous and muscular tissues are equally affected in carditis, the cellular tissue appears not less so: it may even be said to be

sometimes partially destroyed, since in many subjects, as has been proved above, the muscular fibres are loose and detached, doubtless in consequence of the destruction of the interposing cellular substance.

It appears to me exceedingly difficult, if not altogether impossible, to bring together a series of specific signs, by which to distinguish carditis from pericarditis. The signs and symptoms appear to be the same in both. Might we not say that their greater intensity in the one case than in the other, constitutes the difference? Nevertheless, sharp, poignant, deep-seated pain in the region of the heart, and the greater frequency of the faintings are noted by some authors, to a certain degree, as pathognomonic of carditis, yet I have seen these signs also in pericarditis.

Carditis may have the greater number of terminations common to inflammation in general.

FIRST.

Termination by Suppuration.

Suppuration is so common a termination of inflammation of the heart, that at the close of carditis, pus is always found in the cavity of the pericardium. But is it not formed by the serous membrane of the heart, since it is also found when the pericardium alone is inflamed? Some of the cases quoted in the preceding section, answer this question, by shewing that in most instances, the fleshy fibres of the heart are

separated from each other, and isolated by the suppuration, which appears more easily and readily to destroy the cellular tissue which unites them. Do we not also read of collections of pus even in the thick and muscular substance of the heart?

Barrerus gives an instance of a young man, aged 19 years, affected with a troublesome gonorrhæa, who was seized with acute fever and very violent pain in the hypogastric region. These symptoms having disappeared, he was attacked with strong and continual palpitations, and very great difficulty in breathing: the lower extremities swelled, the pulse became weak, the pains increased, and the patient died in the most dreadful agonies.

On opening the body, an abscess was found in the hypogastric region, between the peritoneum and abdominal muscles, and another, more than an inch long, situated towards the point of the right ventricle of the heart.

Forestus, *Fontanus*, and many other writers, have found abscesses in different parts of the heart.

Suppuration then may take place upon the external surface of the heart, as happens in *pericarditis*, in which disease the outside of that organ is usually inflamed. It may also take place, and the pus may collect in the interior of the muscular substance of its parietes, as is proved in the formation of the abscess I have been speaking of; it may even occur in the cavities of the organ, as in the case where I found the fleshy pillar torn and suppurated in the very place where it was ruptured.

SECOND.

Gangrene of the Heart.

Inflammation of the heart might also be expected to terminate in gangrene, which, however, but very rarely occurs. I do not know even a single well-attested instance of gangrene of the heart originating directly in acute and manifest carditis. Authors, it is true, have given many instances of this disease; but, in general, the history of them is exceedingly incomplete, and tends to confirm what has been advanced, because no mention is made of previous inflammation. The examples which I shall give, are rather proofs of my inquiries, than well marked instances of inflammation of the heart terminating in this manner. I think I might venture to maintain, that gangrene, as a stage of inflammation, never takes place in the heart; because the previous stages must necessarily so much interrupt the functions of that organ, and produce such general derangement, that the patient inevitably sinks before the inflammation can reach this stage.

I do not recollect ever having seen an instance of this disease; but my colleague, *M. Leroux*, has lately had an opportunity of witnessing such a case; the particulars of which are as follow:

A Woman, aged 50 years, who had been ill for five months, came into the Hospital, on the 27th of June, 1805.

The whole body was swollen; the œdema had increased from the beginning of the complaint, and was most considerable on the right side. The skin was white, and the face pale. The chest did not sound in the region of the heart, where feeble and diffused pulsations were felt. The pulse was remarkably feeble.

This woman tried aperients, drastic purgatives, and tonics, without success; the anasarca increased; she became excessively weak; and died a month after her entrance into the Hospital, and six months from the commencement of her complaint.

On opening the body, the lungs, adherent to the pleura, were œdematous, and but little crepitous. Several ounces of reddish serum were effused in the right cavities of the chest and in that of the pericardium.

The heart was twice its natural size; its substance was soft and flabby; it had on its surface many livid, blackish, and gangrenous patches, strewed with little white granulations, resembling those which are found upon the intestines after chronic inflammation; the change, indicated by these patches, penetrated the whole substance of the heart, the fleshy fibres of which tore as if gangrenous.

The orifices of the heart were free, except the aortic, the area of which was contracted by osseous concretions, which filled up the spaces between the sigmoid valves, and kept them in a state of permanent tension and immobility, a peculiar cause of the dilatation of the heart. The internal surface of the aorta was sprinkled with small ossified points; its external surface

looked as if ecchymosed. The blood, contained in the heart and vessels, was black and fluid.

The liver, black and marbled, was gorged with blood. The inside of the stomach was of a livid red ; its internal membrane easily separated from the others, on scratching it with the nail. The small intestines had on their surface gangrenous patches, resembling those on the heart; they penetrated through all the coats, which were thickened, but not ulcerated.

Although the state above described is evidently gangrenous, yet from the constitution of the patient, and the symptoms and progress of the complaint, I cannot view it as the immediate consequence of inflammation, of which there were no traces, but rather as a mortification, resulting from extreme debility. In a word, this gangrene appears to me much more to resemble senile or spontaneous gangrene, than any other species of that disease.

The following cases prove that gangrene of the heart may arise from different causes, as in one of them it appears to have been produced by a pestilential fever, in the other by an idiopathic inflammation of that organ.

Deideir relates, that a woman, 30 years old, of a sanguineous temperament, was attacked by a pestilential fever. A bubo formed under the arm-pit, and a lethargic sleep was soon followed by death. On opening the body, a vast quantity of black and grumous blood was found in the heart; the left auricle had a gangrenous appearance.

J. Bauhin cites an instance of a man, who had slight fever accompanied by a little cough, followed by pain in the chest, and upper part of the belly. To these symptoms were added frequent faintings, which soon terminated in death. The lungs were broken down; the cavity of the chest was full of putrid and coagulated blood. The pericardium contained more than a pint of pus; almost the entire substance of the heart was destroyed and putrified.

It is difficult to conceive how a gangrene of the whole substance of such an organ as the heart, whose action is indispensible to life, can take place; and I am much disposed to believe that the softening of its substance, observed by many practitioners after carditis, has been more than once mistaken for a gangrenous state. If I were not afraid of multiplying my cases, it would be easy to prove, that many old authors are not agreed among themselves as to what they call gangrene of the heart.

THIRD.

Ulcers of the Heart.

Instances of ulcerations of the heart, in consequence of its previous inflammation, are far from being rare, and almost always, as I observed in the last article, on opening the bodies of individuals who have died of carditis, or even pericarditis, we find that organ in a state of suppuration throughout its surface.

But besides these frequent and more general ulcerations, it would appear, from a number

of facts, that other ulcerations form upon the heart, either in consequence of a local inflammation of small extent, or from some other at present unknown cause, and which, exciting a partial ulceration, does not produce death until the patient has passed through all the degrees of atrophy.

In treating, in the preceding section, of suppuration of the heart, I gave some instances of ulceration of it, usually superficial, and produced by general inflammation of the organ. I am now about to cite some abridged cases, which seem to prove the existence of ulcerations of the second kind, usually deeper, and to which the name of ulcer seems more properly to apply.

In the body of a man, who had wasted slowly, were found, according to *Fernel*, three foul and very deep ulcers in the substance of the heart. One might judge, says he, that they were of long standing.

According to the account of *Marchettis*, a man, who had long been in a state of decay, died suddenly; on opening whose body, a large ulcer was found, which had eaten not only through the membranous capsule of the heart, but also a large portion of that viscus. The ulceration, having finally penetrated into the left ventricle, caused his death.

Morgagni has also in his work a case exactly similar to this last.

Section II.

OF RUPTURE OF THE HEART.

Rupture of the heart may be divided into complete or partial. By complete rupture, I mean the bursting of the parietes from the interior to the exterior surface, by which the blood is effused into the cavity of the pericardium. By partial rupture, I mean that which takes place only in a portion of the substance of the heart: such are the ruptures which I have witnessed in the carneæ columnæ of the interior of the ventricles, and in the chordæ tendineæ, which rise from these columnæ, and are attached to the floating edges of the auriculo-ventricular valves.

FIRST.

Of complete Rupture of the Heart.

Complete rupture of the heart has rarely been observed in the healthy state of this organ. Some instances, however, may be cited of this organic lesion, in consequence of a violent effort, a fit of passion, an epileptic paroxysm, or in actu coitus.*

* Perhaps there is no better marked instance upon record of the rupture of the heart, without any previous symptoms of a disease of that organ, and unattended even by any of those circumstances which are said occasionally to produce this affection, than that of our late Sovereign George the Second, which is thus related by Dr. Smollett:

"On the twenty-fifth day of October, 1760, George II. King of Great Britain, without any previous disorder, was in the morning suddenly seized with the agony of death, at

It should seem that the rupture which arises from these causes, is likely to recur more frequently in the auricles, in consequence of their thinness, than in the ventricles. But the facts collected by *Verbrugge (Disert. de Aneurysm)* prove the contrary, and that even the left ventricle is more liable to this affection than the right. Sometimes also ruptures occur at the beginning of the great venous trunks; in which case, effusion of blood equally takes place in the cavity of the pericardium.

Observers do not abound in facts which attest the rupture of the heart, when this organ has not been previously diseased: but we find in their works, a considerable number of cases which prove the existence of this rupture where its muscular parietes are in a morbid state.

I have not had an opportunity of observing either of these two kinds of complete rupture. The diseases which dispose the heart to them, are aneurisms, particularly when they have made great progress, ulcerations, and softening of the fleshy substance of that organ, a probable result of its inflammation, and also violent contusions. Here follow some cases taken from different authors.

the Palace at Kensington. An attempt was made to bleed him, but without effect; and, indeed, his malady was far beyond the reach of art: for when the cavity of the thorax or chest was opened, and inspected by the Serjeant Surgeons, they found the right ventricle of the heart actually ruptured, and a great quantity of blood discharged through the aperture into the surrounding pericardium; so that he must have died instantaneously, in consequence of the effusion. The case, however, was so extraordinary, that we question whether there is such another instance upon record."

T.

An old hypochondriac, according to *Morgagni*, (Letter 44, Article 15,) was seized with a violent pain which seemed to arise from the belly up to the chest, accompanied by difficulty in breathing, and convulsive motions: these symptoms took him off in three days.

On opening the body, blood was found effused into the cavity of the pericardium, by three holes, which penetrated into the left ventricle, the cavity of which was three times as large as in a natural state.

A Man, according to the same author, had had ulcers in his legs, which were healed; he experienced, particularly after dinner, uneasiness in the chest, and felt as if vapours were mounting from thence to the head. He died suddenly in one of these paroxysms.

On examination, the pericardium was full, and as if distended with black and coagulated blood; which had escaped through a rent in a part of the heart, which appeared corroded and to have been long ulcerated.

We may easily conceive that death is always the consequence of effusion of blood, produced by rupture of the heart: nevertheless it is not always immediately so. Many facts attest that two or three days have previously elapsed; probably, because the blood, in these cases, passed through a small or oblique orifice, and therefore slowly and in small quantity.

I think it right to observe, that hitherto it has been my intention to speak only of spontaneous ruptures or rents, and not of wounds or perforations of the heart. It is from an unwillingness to confound these lesions together, that

I have not spoken of some facts analogous to that related by *Fanton*, who saw a man that lived 23 days after he had been wounded in the left ventricle of the heart, the fibres of which were lacerated and destroyed. In this, certainly very extraordinary case, it is probable that the perforation was not complete. However, a number of the facts collected by *Senac* and *Morgagni*, assure us, that even where the heart is completely perforated, instant death does not always follow; and even that event is not without exception.

Wounds of the heart belonging only indirectly to my subject, I shall confine myself to what I have already said.

SECOND.

Of Rupture of a part of the Heart.

The organic lesions of the heart which I mean to include under the denomination of partial ruptures, are, 1st, The rupture of one of the carneæ columnæ, which are found on the internal surface of the ventricles. 2d, The rupture of the chordæ tendineæ, which, rising from those pillars, are attached to the floating extremities of the valves.

Haller, considering on the one hand the weakness of these tendinous cords of the heart, and on the other, the exertions they have to undergo, was astonished that no one had ever seen them ruptured. I know not that any one, before myself, has given a well-marked case of this kind of lesion.

Senac has hinted at it, it is true, in a tolerably distinct manner, under the article "Of Ulcers of the Heart," (vol. 2, page 386) when he says, "the columnæ of the heart are thin in several places, and by the efforts of this organ may be too powerfully pulled, or even torn: their action may also at their roots lacerate its substance, and occasion inflammation and suppuration." He had, however, never seen any instances of this kind, but quotes one from *Benivenius*, another from *Dulaurens*, and a third from *Lazarus Riviere;* these cases are, notwithstanding, very far from being satisfactory. *Senac*, however, saw the possibility of the fact of which I am about to give some examples.

Morgagni does not more abound in cases of this kind. He speaks only (l. 21, art 49), of the pillars of the ventricles tearing, with the greatest ease, in the heart of a young man who died of an aneurism of that organ. The case, which does not at all resemble those which I shall cite, nevertheless confirms them: for, from the easy tearing to the actual tearing, the transition is not great; the exciting cause alone is wanting: now the violent exercise, and the moral agonies of the subject of my case, form that cause, which was wanting in the one of which *Morgagni* speaks. Nevertheless, there is a considerable difference: for in the subject of *Morgagni's* case, the tissue was weak and dilated, while it was sound in the one I have described; besides, the living fibre giving way by the efforts of the parts, is quite a different thing from the tearing of the dead fibre.

These ruptures most frequently occur in consequence of violent efforts; the individual, in this case, passes from health to incurable disease, which is often even speedily fatal; at any rate we may so conclude from the cases that follow.

Case 40.—A Man, aged 20 years, of a vigorous constitution, was admitted into the Hospital of la Charité, at an early period of the French revolution. For some time he had quitted a sedentary trade to become a messenger; devoted to this very laborious life, he travelled incessantly to every Court in Europe. When he came into the Hospital, he had been travelling a thousand leagues on horseback, without taking repose; he had, besides, taken a journey from London to Paris; and in passing from Dover to Calais, he had experienced, for the first time, difficulty in breathing, and a spitting of blood; having, notwithstanding these symptoms, continued his journey, the disease had much increased, and by the time he had reached Paris, was accompanied by pain in the chest. He had been bled five times during the three days he had kept at home, but finding no relief from the bleedings and other treatment which had been deemed necessary, he came to the Hospital eight days after the commencement of the disease.

The features of the face were then much altered, and the extremities slightly œdematous; the pulse was small, hard, very frequent, and rather irregular. On applying the hand to the region of the heart, besides the very strong pulsations of that organ, confused and irregular beatings were felt, not at all resembling its natural movements. The patient could not con-

tinue long lying, standing or sitting, and was in a state of anxiety and agitation not to be described.

His legs and thighs swelled the day after his entrance; and his features became still more changed. During the following night, the symptoms increased; he was dreadfully agitated, walking into the other wards, sitting down, incessantly rising, but still preserving his mental faculties. The sense of suffocation now becoming highly alarming, this unfortunate man was convinced of the danger of his situation, and abandoned himself to the most violent despair; he died, testifying by all his gestures, the regret he felt at quitting life.

I repeated, before I opened the body, what I had announced on the first day, that there existed in this patient an acute lesion of the heart, and probably a rupture or laceration of some part of it.

The left lung was sound; the right had contracted slight adhesions to the costal pleura; its upper lobe was very firm, but without tubercles; in the ridges which separate the different lobes, there was a lymphatic coat, produced by the consecutive inflammation, of which this organ had evidently been the seat. There was a quantity of water in the chest.

The pericardium contained about half a pint of yellowish serum. The heart had not acquired an extraordinary size. One of the large columnæ which support the mitral valves of the left ventricle, had ruptured at its base, so that it floated loosely in that cavity; there was an appearance of suppuration at that point of the heart where the rupture had occurred, prov-

ng that it was not of long standing. Near the rent there was a clot of blood covered with purulent matter, which came from the torn part.

It would take too much time for me to point out in detail, why I considered this complaint, which had some of the symptoms of peripneumonia and some of those of carditis, as an organic lesion of the heart, rather than either of those diseases; still it may be useful concisely to state the principal reasons which prevented me from making that mistake.

1. Peripneumonia, or pneumonia, is attended by a fixed, inflammatory, and local pain, which did not exist in the case in question.

2. Pneumonia almost always allows the patient to lie down, which the person whose case I have been describing, could not do.

3 Pneumonia generally terminates, in bad cases, with delirium, and a kind of suffocative cough, the bronchiæ and trachea becoming choaked up; there is also a loud rattling in the throat: nothing of this kind occurred in the above case.

4. In pneumonia, the difficulty of breathing is usually extreme, the cough frequent and very painful, and the expectoration bloody; phenomena which did not exist in the case alluded to.

5. In pneumonia, the agitation, the anxiety, and the agonies exist, it is true, but never (and I have seen a great number of those diseases) to the alarming and peculiar degree in which they existed in this case.

6. In pneumonia, under which the patient sinks about the tenth or twelfth day, when in other respects young and healthy, there rarely

exists any remarkable swelling of the lower extremities, as he is able to keep his bed.

7. In *carditis*, great anxiety and agony certainly exist, as in the cited case; but frequent faintings, cold shiverings, and, finally, delirium and cold sweats also occur, which did not take place in this instance.

8. In *carditis*, the pulse is very irregular, which was not the case in the Messenger's disease.

9. Finally, *acute carditis*, as described by authors, is almost always more rapid in its progress, and is never attended by swelling of the lower extremities. But to return.

Case 41.—A Turner, aged 34 years, of a strong constitution, and of an irritable and violent temper, gave himself, in endeavouring to move a tun of brandy, to use his own words, a *twist of the reins*, which immediately caused a sense of suffocation and an acute pain between the shoulders; soon afterwards, cough, palpitations of the heart and frequent startings in his sleep took place. These alarming symptoms far from yielding to the remedies used, and becoming every day worse, he went to the Hospital of la Charité, where, during his first residence, he received much relief. He quitted it, but returned in four months, when nearly two years had elapsed since the violent exertion which appeared to have produced the disease.

On the 24th of March, 1803, the day on which he came into the Clinical Ward, this patient was in a state of extreme anxiety; his breathing was suffocative; and he felt acute pains in the region of the heart, which forced him

to cry out, particularly during the night. He died in two days.

On opening the body, I found, in the right cavity of the chest, four pints of serum. The lungs of this side were sound. The left thoracic cavity contained but little water.

On the forepart of the mediastinum there was a small purulent spot of the size of a six-pence, without any alteration of the cartilage of that side, to which this kind of ulceration corresponded. The heart, with its capsule, was three times its natural size.

On the exterior surface of the pericardium, there were a number of excrescences, shaped like a cock's-comb, pale and livid at the base, but of a deep red at their summit; they were nothing but portions of fat which had undergone a peculiar kind of change. This membranous capsule adhered to the heart by means of a firm, fatty substance.

All the cavities of the heart were dilated, and contained much black and coagulated blood.

The right auricle was so much dilated, that its auricular appendix had entirely disappeared; the right auriculo-ventricular aperture was also much dilated, and the ventricle slightly so; the tricuspid valves and those of the pulmonary artery were in a good state.

The left auricle and ventricle had much increased in volume. The parietes of the ventricle were thickened, and the mitral valves studded with several soft and fleshy-like excrescences.

On examining the tendons of the fleshy pillars which support these valves, two of them

appeared to have been ruptured for some time. Their extremities were soft, smooth, and rounded at the ruptured part. The precise point of the edge of the valves to which they had been attached, could not be discerned.

The valves of the aorta were not altered, but this artery was itself dilated at the beginning of its arch.

There was some water in the abdomen; the viscera of this cavity were sound.

To these two cases may be added that before reported (Case 33). The only difference between that case and the two last, is, that in the former the alteration appeared to be produced by erosion, in the latter by rupture.

Some difference appears also in the lesion of the two patients of whom I have been speaking; since in the Messenger the injury was probably of recent, in the Turner, of older date; in one, a small portion only of the heart was diseased, in the other, the entire organ appeared to have changed with time. In each, its functions were remarkably deranged. In the Messenger, the disease was more rapid, doubtless because the rupture had taken place in the substance of the fleshy pillar. In the Turner, the lesion although not less dangerous, had become in some degree chronic, because the tendinous cords alone had been torn. The result of these ruptures, was, in the first case, a species of internal ulcer, in the second, an aneurismal dilatation.

Although the subjects of these cases underwent an extreme and peculiar anxiety, acute pains and alarming symptoms, yet I can readily imagine that the action of the heart was much less deranged than it would have been if a simi-

rupture had taken place in the substance of the valves; these membranous sails, detached from the tendons which confine them, would freely float in the cavity of the ventricle; what disorder would not such a lesion produce in the phenomena of the circulation!

It appears well proved, by the hasty progress and the traces of the disease, that the rupture, in the Messenger's case, took place suddenly; but it was not so in the Turner's. In fact, the first effort in these kinds of affections, is often only a pre-disposing cause of the rupture, which is finally produced by a fresh effort, often less powerful than the first; but the part being then weakened by the one, is incapable of resisting the other.

Section III.

OF TUMORS OF THE HEART AND OTHER UNNATURAL STATES OF THAT ORGAN.

To this article belong a great number of facts, the greater part of which did not come under my observation.

FIRST.

In treating upon aneurisms of the heart in general, I observed, that there is little analogy between them and aneurisms of the extremities. I even indicated, to a certain extent, the points of difference and resemblance, between these two affections. A very extraordinary, and indeed

unexampled case, which has come under my observation, proves, that the heart, besides the dilatations which are peculiar to it, may become the seat of aneurismal tumors perfectly resembling those which take place in the arteries of the extremities.

Case 42.—A Negro, aged 27 years, was received into the Hospital of la Charité, on the 17th of October, 1796. On the day of his entrance he was in a state of indescribable anguish and anxiety: the history of his complaint could not be collected; his respiration was difficult and interrupted: he had little pain in the chest, which moreover sounded well on every side; he complained, however, of much pain about the stomach and liver; the pulse was small, contracted, weak, and frequent. The day after he came into the Hospital he had a violent nasal hemorrhage, which hastened his death, an event which occurred on that day.

On opening the body, the heart was found of its natural size; but on the upper side of the left ventricle there was a tumor, almost as large as the heart itself, the base of which was confounded with the parietes of that organ. In cutting through this tumor, I divided a cartilaginous-like layer, almost as thick as the ventricle. The tumor was nearly as firm as cartilage, but in appearance and colour, it resembled muscle. It contained several beds of thickish clots, perfectly resembling those which are found in the cavity of aneurisms of the extremities, except that they were rather paler. It communicated with the interior of the ventricle by a small opening, the edges of which were smooth and

polished. It is evident that this tumor was formed between the fleshy substance of the heart and the membranous covering that it receives from the pericardium, which closely adhered to the surface of this pouch.

The mitral valves were thickened and ossified.

The stomach and small intestines contained much blood, nearly pure and coagulated, the evident consequence of hemorrhage.

How can the formation of this tumor be accounted for? Could it arise from an incomplete rupture of the interior muscular parietes of the heart? What cause could have produced such rupture? Could the external laminæ which remained untorn, have undergone dilatation, and formed an aneurismal tumor?

I say nothing of the signs of the affection of which I have been speaking, it being impossible to point them out from an isolated fact. In such cases as this, the most experienced practitioner, after having recognized the existence of a disease of the heart, would expose himself to error in the particular designation that he might give to this kind of lesion, unless some new and similar facts should throw light upon the diagnostic.

We find in some works, accounts of tumors very much resembling that which I have been describing, but still not perfectly analogous.

A fact which approaches nearest to the one in question, is thus given in the "*Melanges des curieux de la Nature.*"

On opening the body of a man who had died suddenly, a membranous fleshy tumor was found

adhering to the heart, and resembling it in shape and size. It was surrounded by varicose veins, which, by giving way, had filled the pericardium with blood.

We read also in the same work, that in a nearly similar case, there was found, at the basis of the heart, a tumor of the size of a pigeon's egg, surrounded by many other smaller tumors, which were all smooth and united together, and contained a fluid resembling the lees of wine.

Some other tumors have also been observed upon the external surface of the heart, of which I will give an example.

Morgagni, (Letter 21, Article 4,) relates, that a Man, aged 74 years, who much frequented taverns, and had, during the latter years of his life, been subject to inflammations of the chest, came into the Hospital of Padua, without any of the symptoms of a disease of the heart. He died, and on opening his body there was found, at the posterior part of the left ventricle, about two fingers breadth above the apex of the heart, a tubercle of the size and shape of a cherry, half of which was buried in the substance of that viscus, while the other half rose above its surface. This tumor resembled the hydatids which are found upon the surface of the other viscera; on puncturing it, a little serum, &c. escaped. What *Morgagni* says of this tumor, does not prove that it was a true hydatid.

The cases of *Rolfinkius,* who saw several hydatids on the heart, do not appear to me more clear. It is possible that these supposed hydatids might be nothing more than simple cyst-

forming upon the surface, as they sometimes form in the interior, of that organ. The only instance, within my knowledge, of these internal cysts, has been given by *M. Dupuytren* in the "Journal de Medicine," for October, 1802.

SECOND.

Perforation of the Septum of the Ventricles.

The perforation of the septum of the ventricles or auricles, is among the rare facts which I have seen, and of which authors have given some examples: here follow two, which came under my own observation.

Case 43.—A child, aged 12 years and an half, was admitted on the 21st of April, 1797, into the Clinical Ward. He was then in so dreadful a state, that there was reason to think he could not live many days. His complaint, according to his own account, had not existed for more than five months: but, from the violent and repeated palpitations which he had always experienced, it was not unreasonable to suppose, that the disease was of much longer date.

When this boy was admitted into the Hospital, his face was bloated and his lips were violet; there was no œdema in either the upper or lower extremities; the respiration was much impeded; the hand, placed upon the region of the heart, felt an irregular beating, accompanied by a very remarkable rustling. The pulse was, nevertheless, very regular, but small, weak, and easily suppressed. The palpi-

tations were frequent, and came by paroxysms accompanied by threatening suffocation. The patient could not lie down ; he was better when sitting upright, and still more so when inclining forward. He made water frequently, and in proper quantity.

During his short stay at the Hospital, his disease made an alarming progress. He was put under a course of diuretics and powerful antispasmodics, but they procured, as had been foreseen, no relief.

On the 24th, he had a fit of suffocation, stronger than any which had preceded it, and which threatened to terminate his existence ; but this paroxysm went off, and the patient some moments after, found himself better than he had been for a long time. However, more alarming symptoms soon returned, and he died on the 25th, after an agony of from ten to twelve hours, during which his body was covered with a cold sweat, and a yellowish froth dribbled from his mouth.

On opening his body, the lungs, except being rather flabby, were in a healthy state. The pericardium contained a small quantity of water.

The heart was much enlarged, and appeared rather to belong to a large and full grown man, than to so young a child. There was nothing remarkable in the auricles but their increased size.

The parietes of the right ventricle were thicker than usual. The septum had preserved its natural thickness, but there was a round hole in it, near the spot where the pulmonary artery takes its rise, large enough to admit the ex-

tremity of the little finger. This opening communicated with the cavity of the left ventricle; its edges were smooth and whitish throughout. At the upper part of the margin of this aperture, there were two little fleshy tubercles, of a reddish colour.

The parietes of the left ventricle had preserved their natural thickness. In the cavity of this ventricle, just below one of the sigmoid valves of the aorta, the opening of the hole I have been speaking of, could be perceived. The aortic semi-lunar valve, beneath which it was situated, was corroded, and in part destroyed. It formed a kind of little fringe, which presented itself at the orifice of communication without entirely closing it; so that the blood, propelled from the left ventricle into the aorta, could, when this ventricle ceased to act, flow back, on account of the destruction of the sigmoid valve, into the right ventricle, by passing through this unnatural opening, the direction of which, however, appeared to be from the right towards the left ventricle.

An important question, which, after the details of the case, and the examination of the body, seems still undecided, is, whether this opening existed from birth, or were accidentally formed by rupture or erosion. In the first case, it might be considered as a vicious conformation; in the second, it should be placed in the class of organic diseases. The smooth and tendinous-like nature of its edges favour the former opinion, while the erosion of one of the semi-lunar valves extending even to the margin of the opening, and the existence of the tubercles, incline one to embrace the latter.

The perforation of the septum of the ventricle has some analogy with the non-occlusion *(persistance)* of the foramen ovale in the adult. The modifications which these pathological states induce in the circulation, appear to resemble each other so much, that I will not take them into consideration, until I have given an instance of the latter affection.

Case 44.—A Postilion, aged 57 years, having received some violent blows upon the epigastric region with the fist, experienced, for three weeks afterwards, frequent faintings, acute pains in the part, and difficulty of breathing. At the end of this period, which he passed in bed, the pains diminished; the faintings became less frequent, and at length ceased altogether; but the difficulty of breathing remained the same for several months, when a fresh accident gave rise to fresh symptoms. A heavy weight having fallen upon the same part, to the first symptoms were soon added palpitations, accompanied by dyspnœa and a sense of dragging of the anterior mediastinum; from this time, the patient could not go up stairs without often stopping to take breath.

When he came into the Hospital, the first injury had taken place two years, the second sixteen months. His body was then in a remarkable state of fulness; his face of a red colour, approaching to violet; he had often strong and irregular palpitations; the breathing was tolerably tranquil when he was still, but on the slightest motion it became frequent, painful and noisy. The pulse was extremely irregular; the chest did not sound so well on the left as on the

right side; there was no swelling in the extremities; the appetite was good; the digestion nearly natural; and the urine in small quantity. On my first examination, I was convinced of the existence of a disease of the heart, and was disposed, from the peculiarity of the symptoms, to suspect a lesion of the right cavities, but was not prepared to say of what nature.

One bleeding, aperients and antispasmodics, soon alleviated these primary symptoms. The patient, after having remained in the Hospital thirty-five days, quitted it, only to return in three months, in a still more dreadful state. Besides the difficulty of breathing, the sense of suffocation, and the palpitations which before existed, swelling of the legs, tumefaction of the abdomen, and a fatiguing and obstinate cough, were superadded; the pulse was more irregular than ever, and scarcely had he fallen asleep when he awoke with starting and threatening suffocation. During this second stay, he tried compound hydromel, aperient drinks, squill-lohochs, bitter and diuretic wine. After using these remedies for forty-one days, the symptoms became much more supportable, and the swelling of the belly and extremities totally diappeared. On the 18th of October, 1802, he again quitted the Hospital; but I predicted that he would soon return.

In fact, after having worked at his business fifty-two days, a return of the symptoms obliged him to come to the Hospital for the third time; which he again quitted on the 8th of September, 1805, only to return for the last time, on the 25th of October following. The face was then of a red purple; the lips were suffused and

bluish; the voice was hoarse; the breathing noisy, whistling, and extremely difficult; the palpitations were frequent, painful, and diffused; the belly was tumefied; the urine scanty and turbid; the sleep interrupted by frequent paroxysms of suffocation: and the appetite tolerably good.

The same views guided my treatment as heretofore. By the use of bitter and diuretic wine and aperient drinks, by the abstraction of blood, either by venesection or leeches, I succeeded in producing a state of health consolatory to the patient, but far from satisfactory to myself. In a short time, the most powerful means acted but feebly; the serous diathesis predominated, the sense of suffocation increased, and an acute pain took place in the region of the heart; a blister applied to the part, soon removed this symptom, which I considered as peripneumonic. The faintings occurred frequently, and the anxiety became extreme. As it was not possible for this man to last much longer, all active means were abandoned, and the treatment was entirely confined to diluent and grateful drinks. On the 22d of March, 1804, the symptoms became still more violent; the face lost some of its colour, and a manifest change could be perceived in the countenance, which, by the 27th, was still more altered. Finally, the patient died as if suffocated, at three o'clock on the following morning. He had then been ill four years, and it was more than five months since he came for the fourth time into the Hospital.

At the time of opening the body, the face was swollen, and of a violet colour. The integuments were very œdematous; this was par-

ticularly remarkable on the left side of the abdomen, where there was a large tumor, very resisting to the touch, but which was entirely owing to the greater degree of œdema in this than in any other part.

The chest sounded well on percussion throughout the right side, and for about a third of the upper part of the left, but in the two lower thirds the sound was scarcely perceptible.

There was nothing remarkable in the cavity of the cranium.

On opening the chest, I found the right lung very large, although healthy, crepitous, and free from adhesions; the left equally crepitous, adhered to the costal pleura; the pericardium, much dilated, occupied the greater part of the left cavity of the chest, and pushed the lung upward; it contained at least two pints of clear, straw-coloured serum, in which the heart, much larger than natural, was immersed.

The right auricle was considerably dilated, and its parietes were much firmer and thicker than usual; on the interior surface were columnæ carneæ, as strong as those of the left ventricle; the auriculo-ventricular aperture of this side was so dilated that it would admit the ends of four fingers united. The tricuspid valves were large in proportion to the dilatation of these cavities and their communicating aperture; their organization was not changed. The cavity of the right ventricle was enormous, and greatly disproportionate to that of the left; its parietes were much thickened, and its fleshy pillars more firm and prominent than usual.

The left auricle was unusually large, but its parietes were not thicker than a common membrane, and its interior surface smooth, and whitish, had no appearance of the usual fleshy pillars. The septum which divides the two auricles, had become much widened in consequence of the great enlargement of their cavities. In the middle of the septum might be perceived the foramen ovale, about two inches in diameter, perforated by a hole more than an inch wide, of an oval form or rather irregularly circular.

The edges of this aperture were thin, smooth, whitish, and tendinous-like. It was impossible to judge from them, whether the direction was more particularly from one cavity than the other.

The left auriculo-ventricular aperture, was rather hard, whitish and contracted, but still large enough to admit the end of a finger.

The mitral valves were a little thickened and rugose towards their base as well as their floating edges.

The cavity of the left ventricle was scarcely large enough to hold a walnut; its muscular parietes were a little thickened and rather harder than usual, doubtless from their being contracted.

The aorta, small in diameter at its commencement, was in other respects natural. The pulmonary artery was much dilated at its mouth, and also where it divides; its semi-lunar valves were likewise much enlarged. The canaliculus arteriosus was changed into a ligament.

The abdominal viscera, in general, appeared healthy. The stomach was of a lively red on its

inner surface. The liver was rather swollen, but without being much gorged with blood.

When I noticed the perforation of the septum of the ventricle, in the subject of Case 43, I knew of no other analogous fact, except that related by *Senac*, (vol. 2, page 414.) Since that period two cases of perforation, similar to that which I have described, have been noticed, the one by *M. Dupuytren*, the other by *M. Beauchene, jun.*

Here follows the case reported by *Senac* from *Pozzis*.

A young man, aged 27 years, was troubled with palpitations; frequent bleedings procured him some relief, but he died in a fainting fit.

The heart was of an extraordinary size; the two ventricles were reduced to one cavity, which contained sixteen ounces of blood; the muscular substance was much thinned; the coronary arteries, much lengthened, were so contracted that they could no longer receive blood; the vena cava was much dilated, and formed a kind of reservoir, or auricle, in which the blood accumulated.

I have given an instance of the foramen ovale being open, and even dilated, in an adult. In the 17th letter of *Morgagni*, there is also a fact which, I think, deserves a place here.

A young woman, who had had weak and bad health from her birth, breathing with difficulty, and whose skin was of a livid colour, died at the age of 17 years.

Her heart was small and its basis rounded; the left ventricle was shaped like the right, while

the right resembled the left, and, although larger, had thicker parietes. The right auricle was also much more fleshy, and twice as large as the left. There was a communication by the foramen ovale, between these cavities, which would admit the little finger. Of the three tricuspid valves, one alone was of its natural size, the other two were smaller than usual. The valves of the pulmonary artery were in a natural state at their base, but cartilaginous at their upper edge, where a part was even ossified: their floating extremities were so united together, that the opening for the passage of the blood was not larger than a lentile. This opening had membranous and fleshy excrescences, so placed as to answer the purpose of valves, by allowing the exit of the blood and preventing its return.

The perforation of the septum of the ventricles in the subject of Case 43, the non-occlusion, and even dilatation of the foramen ovale in that of Case 44, necessarily caused such modifications in the circulation as to give rise to many of the symptoms which preceded the death of these two individuals. What, then, are these modifications and their effects, as far as regard the chemical influence of respiration, and the phenomena of the circulation?

If to enable ourselves to answer the first of these questions, we inquire into the principal effects of such a subversion of the laws of the circulation, we shall find that the whole of the blood, which, after having passed through the vascular arterial circulation, should be conveyed by the veins into the right cavities of the heart, and by the pulmonary artery into the lungs, there

to repair the losses it has sustained, is, in this case, only in part presented to the vivifying influence of the atmospherical air; that a portion of the blood conveyed to the right cavities by the venæ cavæ, instead of being sent by them into the lungs, immediately passes into the left cavities, to repass into the general circulation, without having been previously renovated by the act of respiration; it therefore enters the left side of the heart, without having acquired all that it should acquire, or lost all which it should lose, and hence is deficient in the stimulus proper to excite and determine the regular and free action of that organ. It afterwards travels through the different parts of the body, not only more or less deficient in vivifying and repairing particles, but impregnated with others which it should have lost, and which will also necessarily disturb the regular and healthy action and function of all those parts through which it flows.

Besides the evils which must result to all the parts of the body, and to their functions, from this chemical alteration of the blood, the necessary consequence of the lesions I have been describing, it produces also some effects which are, to a certain degree, mechanical, but equally pernicious; I mean the aneurismal dilatation of one or more of the cavities of the heart. In the two cases which I have cited, the right cavities were dilated; they were even dilated, particularly in the second case, with thickening of their parietes, which, added to the direction of the opening in the first case, proves that the blood was driven from the right ventricle into the left,

Thus, when the parietes of one of these cavities (in the perforation of the septum of the ventricles,) have greater strength and power of contraction than those of the other, the blood, instead of being driven through a single aperture, (the aorta or pulmonary artery) finds a double vent; a portion of it enters the pulmonary artery, when the right ventricle has the greatest power of contraction, while another portion of it passes, at the same time, through the unnatural opening into the left ventricle. Under these circumstances, a portion of the blood, entirely venous, is sent into the general circulation; a small quantity also, without doubt, flows back into the right ventricle to be again remixed with venous blood, &c. &c. Who can describe the disturbance produced in the action of the heart, or the derangement excited in the functions of all the organs, by blood so deficient in its elementary principles, in its stimulating and renovating properties, &c.?

We shall find the same derangement when the opening is in the septum of the auricles instead of that of the ventricles. In fact, if the right contracts with the greater force, the blood will, in part, flow through the foramen ovale into the left auricle, and in part into the right ventricle, which sends it into the lungs, and *vice versa* as to the left auricle. From these remarks it may, perhaps, be inferred, that in these cases I admit the passage of the venous blood into the left cavities, and its admixture with arterial blood, without admitting the passage of the arterial blood into the right cavities, and its admixture with venous blood. But I have not pre-

tended to apply my explanations, except to the cases which I have been relating, and in which, I believe, things took place as I have described. Perhaps a case of an opposite nature may occur, in which, one or other of the openings I have been speaking of existing, the left cavities shall have acquired or preserved a preponderating strength; in which case the arterial blood of the left cavities being pushed into the right, its admixture with venous blood will necessarily result, and not, as in the former case, venous with arterial.

The distinction which I have here been drawing between these two admixtures, may, at first sight, appear of little importance; but, on a little reflection, we shall be convinced, that the mixture of arterial with venous blood in the right cavities, must affect the animal economy in a very different manner from the mixture of venous with arterial blood in the left cavities. Thus, in the first case, (that of the passage of the arterial blood into the right cavities which contain the venous,) what function is likely to be principally deranged? It is certainly sanguification, or the chemical changes which the blood should undergo in the lungs; because, the respiration, instead of acting upon a fluid deprived of certain principles, which it should have lost in the general circulation, will have to act upon blood already loaded in part with those very elements which it is the office of breathing to furnish; in a word, with blood which is scarcely in want of that elaboration which takes place in the pulmonary system.

In the second case, on the contrary, (that of the passage of the venous blood into the left

cavities which contain the arterial,) the economy will be injured in the principles of nutrition, because the mixed blood which the left side of the heart pushes into the arteries of the body, will only be fit, to a certain degree, for nutritive purposes. In fact, it will in part consist of venous blood, which contains less of the principles proper to be assimilated, and which may also contain hurtful principles. Very different effects will be produced by these different states of the blood, yet their symptoms may in time approach each other, and their results may soon be confounded. What will be the consequence of these different subversions of the circulation in the excitement of the organs in general, and of the brain in particular? What will be the effects resulting from parts being in perpetual contact with black blood, which ought to be incessantly excited by red blood? The experiments of *Bichat** seems to answer this question pretty clearly; besides, a more elaborate discussion of these points would carry me beyond my object, perhaps without producing any other result than proving the insufficiency of our knowledge.

At best, in whatever manner we may represent the disturbance in the action of the heart, and the particular or general effects which must necessarily flow from it, and although it may be proved from the disposition of the parts in the cited cases that the blood may more frequently pass from the right into the left ventricle, than from the left into the right, the phenomena

* *Bichat's* Physiological Researches on Life and Death.

and termination of the disease clearly evince, that such a lesion, whether original or accidental, is sooner or later necessarily mortal.

Observations and Reflections on the Blue Disease.

Long before the publication of the first edition of this work, I had, in my lectures, pointed out the habitual blue colour of the face, as a symptom usually belonging to organic lesions of the heart, and particularly of its right cavities, and also of the general venous system which depends more immediately upon them. But my theory being derived solely from such cases as had offered themselves to my own observation, I had not collected a sufficient number of facts to affirm that this particular colour is the constant effect of the perforation of the septa of the heart, or to determine to what degree of intensity this remarkable appearance may be carried. The facts, in which I was deficient, have since presented themselves, and have induced the authors who collected them, I think improperly and too hastily, to give the name of *blue jaundice* or *blue disease* to this discoloration of the skin, the necessary effect of the perforation of the septa of the heart. Other physicians, with still greater impropriety, have considered it as a peculiar disease which they attribute to a species of scorbutic cachexy.

Several cases of this kind having fallen, within a short time, under the observation of *M. Caillot,* a distinguished professor in the

school of Strasburgh, he was induced to call the attention of practitioners to this interesting point. Three cases, the history of which he sent in 1807, to the society of the School of Medicine at Paris, furnished him with the subject of a memoir which he afterwards presented to the Academy of Sciences at Strasburgh. These facts, very similar to some already given in this work, and to several others extracted from the works of different authors, cannot fail to throw some light on the true character of the disease which has been so improperly called *blue jaundice*, or *blue disease*, and attributed to causes totally different from the true ones; here follow the cases of *M. Caillot*.

Case 1.—A Child, aged 11 years, remarkable for a bluish tint over the whole face, was brought in 1801, to *M. Duret*, Professor of Anatomy at Brest. This discoloration had existed from his earliest infancy, and was not at first attended with any remarkable alteration in the exercise of his functions: at the age of sixteen months, the child experienced, for the first time, convulsive motions and faintings, and its face became completely of a violet colour. From this time it had also frequent faintings, which were usually brought on by some effort, particularly violent passion, to which he abandoned himself on the slightest contradiction. He was then quite livid, and appeared as if suffocated. On applying the hand to the region of the heart, the slightest trembling could scarcely be felt. Frictions applied to the chest, or stimulants to the nostrils brought him out of this alarming state.

At five years old he had a nasal hemorrhage which was stopped with difficulty. He was very sensible of cold, and could not take the slightest exercise without feeling much oppressed. Finally, the paroxysms becoming more and more frequent, he died on the 19th of April, 1801, as he was going to the privy.

At the time of opening the body, the integuments of the face, chest, and upper extremities, were of a violet colour aproaching to black. This colour was still more decided at the ends of the fingers and toes: the intestines and the rest of the abdominal viscera, were of a deep brown, and it might have been supposed that all the vessels had been injected with ink. The viscera of the other cavities, were of the same colour; it was hardly possible to distinguish the cortical from the medullary substance of the brain.

The heart, larger than natural, and gorged with blood, presented the following lesions: the unclosed foramen ovale, about four lines in diameter, established a communication between the two auricles. There was also an opening, large enough to admit the fingers, in the septum of the ventricles, the circumference of which was perfectly smooth. On slitting up the aorta, above the sigmoid valves, its area was found to embrace the opening which communicated between the ventricles.

The mouth of the pulmonary artery, much contracted, had but two sigmoid valves. This artery, still more contracted just above its origin, increased in diameter as it removed from the heart; its coats were thinner than natural.

The canaliculus arteriosus completely obliterated, terminated in the left sub-clavian, from which arose the carotid of the same side; while the right sub-clavian and carotid sprang from two separate openings.

The only morbid appearance in the chest, was an enlargement of the thymus gland.

Case 2.—About the same time, and in the same city, there was a child, three years old, named *Guignard*, who constantly kept his bed; he was very weak and thin; his face was of a red violet colour; his gums were swollen, and bled very readily: his fingers and toes terminated with a kind of roundish end, covered by a skin, finer, more shining and livid than that of the face. His parents, being questioned as to the origin and progress of his disease, said, that when two months old, he had been attacked with the hooping cough; that, at this time, his face had assumed a livid colour, which had gradually increased in intensity, even after the hooping cough had left him and ever since; in short, that the child had, every day, become weaker and more languid, and that his growth had been very much impeded.

This child, like the subject of the last case, was liable to faintings, which came on with extreme difficulty of breathing, and were usually accompanied by a general lividness of the skin, though sometimes, on the contrary, by a remarkable paleness.

On the 4th of December, 1803, *Guignard* threw up much blood, and then fell into a profound sleep. On the 6th, a still more alarming

hemorrhage occurred, followed by a lethargy, which lasted two days, when he died.

At the time of examining the body, the skin was violet only at the ends of the fingers. Here and there, however, some ecchymosed-like spots appeared.

The heart, situated transversely in the chest, had its basis turned directly to the right side. The right auricle, distended with black blood, partly fluid and partly coagulated, was alone as large as the rest of the heart. The unclosed foramen ovale would admit a female sound. The parietes of the right ventricle were of a considerable thickness, and its contracted cavity contained but little blood.

After having divided this ventricle in the direction of its axis, an attempt was made to pass a sound into the pulmonary artery, but it immediately got into the aorta. The left ventricle was then opened throughout its length, when a large aperture was perceived towards the base of the septum, establishing a communication between the ventricles. It was necessary to use a stylet to get into the pulmonary artery, so great was the contraction of its orifice. The obliterated canaliculus arteriosus terminated in the left sub-clavian, which furnished the first carotid, while the corresponding arteries of the opposite side formed, from their origin, two separate trunks. Finally, the position of the heart had so changed the relations of the aorta, that instead of turning round the left bronchia, it embraced, in its arch, the right bronchia, and passed behind the lower part of the trachia to reach the left side of the vertebral column.

Case 3.—*M. Caillot* saw also at Brest, about the same time, a child, nine years old, with precisely the same phenomena which were remarked in the subject of the first case; habitual oppression increased by exercise, unpleasant sensations on exposure to cold, nasal hemorrhages, faintings produced by exertion, passion, &c. but, above all, remarkable lividness of countenance; in short, this case resembled the former in every respect.

To the cases quoted from *M. Caillot*, I will add the following.

A Child, two months old, at Glasgow,* was suddenly attacked with difficulty of breathing, even so as to threaten suffocation; at the same time, the skin of the face, fingers and toes, became livid and almost black. The attacks, which were frequently renewed, came on almost periodically, and increased much in duration and intensity; they occurred every morning about ten o'clock, and lasted for several hours. During the paroxysm, the breathing was short and stertorious; the pulse small, frequent aud intermittent; the face swollen and livid; and the temperature of the body sensibly reduced.

The application of heat diminished the symptoms more than any other means. This child died at the age of ten months, in one of the paroxysms.

On opening the body, the heart was found very large; the coronary arteries were much loaded with blood. The aorta, the diameter of

* See Medical Commentaries, by Dr. Duncan.

which was very considerable, sprang from both ventricles by two orifices, each of which would admit the extremity of a finger. The foramen ovale was not quite obliterated; the sigmoid valves of the pulmonary artery were small, adherent to each other, and ossified at their base.

In a supplement to a Treatise on morbid anatomy by Doctor Baillie, there is a still more extraordinary fact, very similar to that which I shall presently quote from *Sandifort.*

The subject of Doctor Baillie's case was a child, who lived two months, during which the skin was constantly of a blue colour, and sensibly cold to the touch.

On examining the body, the pulmonary artery was found to rise from the left ventricle, while the aorta sprang from the right. The canaliculus arteriosus, and the foramen ovale, remained unclosed; without this disposition, there would have been no communication between the aortic and pulmonary systems, and none of the venous blood, brought by the venæ cavæ to the heart, could have reached the lungs. In this extraordinary case, therefore, these communications must not be cousidered as the cause of the disease, but rather as a resource employed by nature for the preservation, ephemeral, it is true, of the individual.

In an inaugural thesis, read in 1805, at Wittemberg, in Saxony, (*Programma de morbo cæruleo)* there is an instance of the same kind, with this peculiarity, that the subject of it lived to be 29 years old.

On opening the body, the heart was found three times its natural size, and its parietes were

an inch thicker than usual. It was of a very firm texture, of a brown colour, and its cavities and vessels were filled with black and coagulated blood. The sigmoid valves were ossified, and the posterior ventricle had marks of incipient ossification. The foramen ovale, and the canaliculus arteriosus, were open; the first very freely. The pulmonary artery was contracted, but the aorta larger than in a natural state. All the abdominal viscera were of a brown colour.

To render complete the picture of these *lusus naturæ*, which seem to reverse all our physiological notions; I must say a few words on the case reported by *Sandifort*, in his work entitled "*Anatomico-pathological Observations.*"

A Child, having enjoyed good health during the first year of its life, was, at the beginning of the second, attacked by all the symptoms which characterize a most dreadful disease of the central organ of the circulation. This affection, the detail of which it would be tedious to give here, became, during the twelve years of the patient's life, more and more alarming. At the expiration of this period, he sunk under his disease, which, from its nature, might have been expected to be more speedily fatal.

On opening the body, besides finding the foramen ovale unclosed, and a dilatation of the right ventricle, the aorta presented an opening into both ventricles, instead of springing from the left ventricle alone.

A fact very similar to this was seen by *Stenon*, and is related by *Th. Bartholin*, in the Memoirs of Copenhagen; but it occurred in a fœtus,

which, from its vicious conformation, should be placed among the cases of monstrosity.

The inference, from all these cases, as *M. Caillot* has well observed, is, that this morbid state which has been called the *blue disease*, is more frequent than was heretofore imagined, that far from being, as some physicians have said, the consequence of a scorbutic cachexy, it is generally produced by a vicious conformation of the heart, either natural or accidental, which, causing an unnatural communication between the right and left cavities, produces a transposition of a quantity of venous blood, and its admixture with arterial.

Whatever, then, may be the unnatural state, whether the opening of communication be situated between the auricles or the ventricles; whether the aorta originate in both ventricles or the canaliculus arteriosus remain unclosed, or whether many of these circumstances exist simultaneously in the same subject, the effect will always be nearly the same, and the disease will be more or less marked, according as the unnatural communications, more or less numerous or ample, may permit a greater or less quantity of the venous to mix with the arterial blood.

I have before said enough to shew, how easy is the explanation of all the principal phenomena of the pretended blue disease, such as the colour of the skin, the difficulty of breathing, the frequent syncope, diminution of vital heat, and finally, the premature, and sometimes sudden death, of most of the subjects of these cases.

In comparing the effects, slowly produced by this species of organic disease, with those which take place more speedily in the different

kinds of asphyxia, does not a striking analogy appear? Is there not a strong resemblance between this state and that in which many infants are found at the moment of birth, particularly after laborious parturition? Their face is more or less of a violet blue, even the body itself has often a high degree of the same colour; in all the body is cold to the touch.

I have found, from experience, that the best method of recovering the new-born infant from this state of asphyxia, is to hold it near a clear fire, and gently rub its head and body with soft and very warm cloths. This plan should be persevered in, and is much preferable to all the aspersions generally employed by accoucheurs.

The examples just quoted, prove that the permanent blue colour of the face and integuments, arises from the unnatural communications between the cavities of the heart; nevertheless, it does not appear that this is always the case; for some instances seem to prove that these communications may exist without any remarkable change in the colour of the skin; but then all the other symptoms of the organic disease are not the less perceptible, and if an error be committed, it can only be in the designation of the particular species of lesion.

Before I conclude this article, on which much more might be said, I would observe that the rupture of that membranous-like substance which obliterates the foramen ovale, or rather, perhaps, its loosening, by a violent effort, may be considered as one of the accidental causes of this disease. Such was the case with the infant in

whom this complaint was brought on by a violent hooping cough.

The diminution of the vital heat, is a circumstance which assists in explaining its cause. May not the non-occlusion of the foramen ovale, as accounting for the power possessed by Divers of remaining long under water, be regarded as a fable, or great error; for how is it possible that this opening can exist from birth to advanced age, withoutinterfering with the health of Divers, who are, generally, very robust? It is certainly a physiological question worthy of re-consideration.

THIRD.

Occlusion of the Foramen Ovale in the Fœtus.

This appears to me the proper place to speak of the occlusion of the foramen ovale in the fœtus: this state has been less frequently noticed than its non-occlusion after birth; a circumstance doubtless arising from still-born children, and those who die soon after delivery, being but rarely opened. It would appear that the unnatural state, of which I am about to speak, is likely to occasion more speedy and serious consequences than that I have just been discussing.

Vieussens, in his Treatise on the Structure of the Heart, Chapter 8, page 35, gives the history of a child, externally well-formed, who had from his birth difficult respiration, a feeble and hoarse voice, the body being of a livid colour and the extremities cold; he lived but 36 hours.

The lungs were much swollen, and their vessels gorged with blood; the right ventricle and the pulmonary artery were very much dilated; and no trace could be found of the foramen ovale.

The blood, in this infant, incapable of passing from the right auricle into the left, as is natural in the fœtal state, was obliged to follow the general course of the circulation. But how could it penetrate and pass through the lungs in the compressed state in which they are before birth, without encountering an almost insurmountable obstacle? Hence arose the dilatation of the right ventricle and pulmonary artery, the hardened and gorged state of the lungs and blood-vessels of that organ. Hence also the leaden colour of the body, the gorged state of the cutaneous capillary veins, of the whole venous system, and even of the right cavities of the heart. The danger, in this unnatural state, would doubtless have been much greater if the canaliculus arteriosus had not existed, to supply, at least in part, the natural and necessary opening which was wanting in this little subject.

FOURTH.

Of Worms found in the Heart.

I might swell this paragraph with a great number of cases, taken from different authors who have pretended to find worms, either in the cavity of the heart, or in that of the pericardium: but most of these relations abound rather with the

wonderful than the true; moreover, I do not know a single modern practitioner who has made mention of any such case; I shall not report those which are to be found in many works on pathological anatomy. I will only remark, that a prejudiced mind may easily meet with worms in the heart, by taking for these insects, white, cylindrical, or even flat lymphatic concretions, which are now and then found, on opening bodies, in the vessels of which, the white part of the blood has coagulated, resembling, but certainly not very much, lumbrici and even tæniæ. It is very possible that this circumstance may have imposed upon some old authors, who, on this subject, as well as many others, have shewn themselves much greater friends to the marvellous than modern writers have done, and who certainly were not in the habit of opening bodies and minutely examining them without prejudice or anticipations.

FIFTH CLASS.

OF ANEURISMS OF THE AORTA.

General Observations.

In surgical nosology, arterial aneurisms have been divided into two great classes, under the denomination of *true* and *false* aneurisms.

If it be decided to call *true* aneurism, that in which all the coats of the artery are thought to be dilated; and to name *false* or *circumscribed*, that in which one of its coats is ruptured or torn, while the others, or only the cellular have undergone a dilatation, the greater number of aneurisms of the aorta would certainly appear to belong to the first class. I say the *greater number*, because some aneurisms of this great arterial trunk are very nearly allied to the *false* aneurism, the principal characters of which I have been briefly examining.*

* It will doubtless be remarked, that I do not here give a precise definition of *true* and *false* aneurisms: we are now more than ever ignorant of the true sense of these denominations, particularly since *Professor Dubois*, and *M. Dupuytren*, have presented to the Society of the School of Medicine, anatomical preparations which seem to prove what many authors have before asserted, that in some cases the internal membrane of arteries may produce a hernia through a rupture of the fibrous tissue, and by its extension furnish the whole internal surface of an aneurismal bag. I must, however, observe, that it is difficult to believe that the organization of the internal membrane of the arteries can sufficiently dilate, to furnish, without tearing, the internal surface of aneurisms of the aorta, so large as they sometimes are.

Before I treat of the causes, effects, signs, and curative means applicable to *true* aneurisms, I think it right to make some remarks upon the species of *false* aneurism of the aorta, which I have just been noticing.

Section I.

OF FALSE ANEURISM OF THE AORTA.

Instances of what I have denominated *false* aneurism of the aorta are not rare, but they claim our particular notice, because, although analogous to the false aneurisms of the arteries of the extremities, the theory by which we account for the formation of the latter, seems in some degree insufficient to explain that of the former.

I think that before I enter upon this discussion, I should give some instances to prove the existence of this species of aneurism of the aorta.

Among the anatomical preparations of pathological facts, in the cabinet of the Faculty of Medicine at Paris, are two of diseases of the aorta, which appear to me to merit the appellation of *false aneurism.*

One of these, marked No. 26, represents the heart surmounted by the arch of the aorta. This artery, from its commencement to the end of the arch, appears to have undergone an inconsiderable dilatation; but on the right part of the convexity of the arch, there is an aneurismal tumour of the size of a tennis-ball. The coats of this pouch, externally white, are internally

marbled, grey and violet, and about two lines thick. The cavity of this tumour opens into that of the aorta, by a circular aperture about ten lines in diameter, the edges of which are smooth, rounded, and about as thick as the coats of the vessel. These coats are not more dilated at this opening than elsewhere, and do not form a kind of cul-de-sac, through the extremity of which it had penetrated: it might rather be said, that the opening between the artery and aneurismal pouch, had been made as with a shoe-maker's tool, and that situated below the mouths of the three arteries which form the aorta ascendens, it might have been taken, if a little less in diameter, for the mouth of a fourth arterial trunk, placed in the same line; a mistake to a certain degree excusable, since it is not very uncommon to see the right subclavian and carotid arteries rise separately from the aorta, instead of springing, as they usually do, together from this common trunk at its curvature.

The second of these anatomical preparations, marked No. 27, represents an aneurism exactly similar to the one just described, and nearly in the same position. It is, however, much smaller, being only about the size of a walnut, and opens into the cavity of the aorta by an aperture as large, in proportion, as that in the former case, but the artery itself is not so dilated.

A still more remarkable case is now before me.

The aorta, in this very well preserved anatomical preparation, seems in no degree altered, as far as the articulation of the last dorsal with the first lumbar vertebra. Even here the arterial

tube is not dilated, but at the posterior part of its cavity, corresponding to the vertebral column, an oval aperture is observable, eight lines long and five wide, with smooth and rounded edges. This opening communicates with an aneurismal bag, as large as the fist; the coats of which, except posteriorly, are formed by a membrano-fibrous substance thicker than the aorta itself. These semi-fibrous coats are supplied posteriorly by the anterior face of the twelfth dorsal and the first lumbar vertebra, which are almost destroyed; between the two hollows produced by the destruction of these bodies may be seen, perfectly sound, the ligamento-cartilaginous intervertebral substance.

These bony parts in the interior of the tumour were in immediate contact with the blood which it contained, but as it extended rather upward than downward, the jet of blood through the opening acted only on the vertebræ situated directly behind it.

To say that these tumours are produced by a lodgment of blood in a cavity, which this fluid makes for itself, in the neighbouring cellular tissue, the united folds of which form its coats, does not appear to me a satisfactory mode of accounting for their formation.

This, perhaps, may be a correct mode of explaining the formation of some aneurisms of the extremities; the abundant cellular substance which surrounds them, may become compressed, flattened and changed into a membranous substance from being situated between two compressing powers; the pressure of the blood on the one hand, and the resistance of the muscles, the neighbouring parts and the skin on the

other. But can aneurisms of the aorta, such as I have been describing, take place in this manner?

The aorta, in the different cavities of the body through which it passes, is nearly throughout its extent in such a state of isolation, compared with the other arteries, that its cellular tunic receiving little support from the neighbouring parts, is left almost entirely to its own extensibility. When a rupture of the aorta takes place, and death does not instantly ensue, may not a large aneurismal tumour be expected suddenly to form? That this does not generally happen, is proved by the three cases just reported, in which the aneurismal tumours were not very considerable.

How then can the formation of *false* aneurisms of the aorta be explained? I must confess that this always has been, and still is, a mystery to me. However, two cases which I am about to relate, may, if supported by similar ones, perhaps lead to a satisfactory explanation; here follows a brief history of them.

Case 45.—In the body of a tall, thin man, who died in the winter of 1799, in the Hospital of la Charité, without my having been enabled to discover the true nature of his complaint, I noticed (after opening the chest, and finding the heart and lungs in a good state,) on the anterior part of the arch of the aorta, a little tumour, of the size of a walnut, and of a black colour, and which I at first took for a gorged bronchial gland; but on endeavouring to thrust my scalpel into its substance, I was struck with the resistance made by its external covering. I

examined it with more attention, and found that it was a real fibrous pouch, adhering, at its base, to the coats of the artery, with which, in a great degree, it appeared to be confounded. It was formed of an external membrane, about two lines thick, and contained a substance not quite so firm as tallow, and of a deep red colour, much resembling the old clots of blood which adhere to the sides of aneurismal sacs.

I suspected that this cyst communicated with the cavity of the vessel to which it was attached, but I sought in vain for any communicating aperture; the external coats of the artery, at the part corresponding to the cavity of the cyst, were destroyed; and it was much thinner here than elsewhere.

Having opened the aorta longitudinally, I could not perceive any aperture of communication; but I saw a greyish and livid spot, which corresponded with the base of the cyst. Curious to follow up the dissection of the aorta in this subject, I traced it with care, proceeding from the chest towards the abdomen, and was much surprized to find upon it, just above the trunk of the cœliac artery, a rather smaller tumour than the one I have been describing, but in all other respects resembling it.

In 1786, dissecting, for other purposes, a very old subject, I observed three similar tumours upon the ventral aorta; the primary iliac arteries had also each one or two. I did not examine the contents of these tumours, but I have no doubt that they were similar to those of the one of which I have been speaking.

I know not whether similar cases have been noticed by other practitioners; but if such tu-

mours should continue to be found, shall we not be enabled easily and satisfactorily to account for those affections which I have named *false* aneurisms of the aorta?

In fact, I am disposed to think, that if the subject of this case had lived longer, the tumours which I noticed, and which had already worn away a great part of the coats of the aorta, and changed the colour of its internal membrane, might finally have completely penetrated the artery. The blood would then have passed, more or less freely, into the cavity of the cyst, suddenly transforming it into a sanguineous tumour, which would have increased, in proportion to the facility with which the blood could have dilated its fibrous parietes.

The aneurismal tumours of which I have spoken, seem much to resemble those I have just been describing; with this difference, however, that in the former, the communication between the vessel and the tumour actually existed, which was not the case in the latter; but had the patient lived much longer, I doubt not that such communication would have taken place.

If these facts should hereafter be confirmed by a number of similar ones, the mode in which some aneurisms form will turn out to be very different from what is usually supposed. It would then appear, that these aneurisms, instead of developing themselves, from within to without, by the dilatation of one or all of the arterial coats, are formed from without, by a kind of erosion, wearing out, or even, if we may use the expression, causing the death of these coats. And the aneurismal bag, instead of being formed of one or many of the dilated arterial

coats, would entirely consist of a membranous, fibrous, and adherent cyst, quite distinct from them.

Yet still to render clear this mode of formation, it would be necessary to know how, and of what this tumour is composed, in what manner and by what means it developes itself; whether it be by some chemical process with which we are unacquainted, or by some unknown acrid humour corroding the internal membrane of the artery, and producing the grey and circumscribed spot, so much resembling a burn, a kind of sphacelus, &c.

Section II.

OF TRUE ANEURISM OF THE AORTA.

General Observations.

In comparing the bulk which aneurisms of the aorta generally attain, with that of *true* aneurisms of the extremities, before they lose that character, we might be induced to suspect that the coats of the aorta were capable of undergoing a much greater degree of dilatation before they burst, than those of other arteries. Nevertheless, if the diameter of the aorta be compared with that of those arteries which are most apt to become the seat of aneurismal dilatations, as, for instance, the popliteal, we might, perhaps, infer that the aorta, before it attains a proportionate degree of enlargement with the other arteries, loses the principal characteristic of *true* aneurism, that is the integrity of all its tunics.

True aneurisms of the aorta appear, both in their developement and termination, to follow the same course as those in other arteries, offering no other differences than such as arise from their different connexions with neighbouring parts.

In fact, in cases of true aneurism, when the dilatation of the coats of the artery of a limb is carried to the highest degree, a rupture takes place, and a mortal hemorrhage would immediately ensue, if the neighbouring cellular membrane, and adjacent parts, did not oppose the effusion of blood, by forming another bag, in which this fluid collects and forms a much larger tumour than before.

The same circumstances take place in true aneurism of the aorta. When the dilatation of the coats of this artery has reached its ultimate point, they burst. This rupture, as in the first case, gives rise to an effusion of blood, which the surrounding parts, and the neighbouring cellular substance, are incapable of stopping.

The only difference, then, between the rupture of a true popliteal aneurism, and that of a true aneurism of the aorta, is, that in the former the rent in the arterial coats changes the tumour into another equally sanguineous, which is called *consecutive false* aneurism, while in the latter it produces instant death.

There is, then, no absolute difference between the course of these two affections. If we could suppose the aorta surrounded by a mass of cellular substance, by muscles and integuments, the rupture of a true aneurism of this artery would not be more dangerous than that of the popliteal, except from the greater quantity of blood in the tumour, by reason of the

larger caliber of the vessel, its greater proximity to the central organ of the circulation, and the impossibility of attempting any kind of operation.

SECOND.

Of the Causes of Aneurisms of the Aorta.

Whatever may be the points of analogy between true aneurism of the aorta and that of other arteries, the causes of the former, which alone at present form the subject of my inquiries, may be referred chiefly to the two principal ones which I am about to indicate.

The first relates to every thing which may derange the circulation; 1st, the increased impelling force of the heart; 2d, impediments to the circulation situated beyond the dilated part.

To the second, belongs every thing that may occasion or promote the weakening or disorganization of a portion of the coats of the vessel, such as violent efforts, blows on the chest, the metastasis of some diseases, among which I think may be placed, the itch, herpes, and rheumatism, (I dare not include lues and scrophula) and a certain acrimonious humour, with the nature of which we probably shall never be acquainted. I know that this opinion clashes with that of many physicians, particularly among the moderns, and, above all, among those who are called solidists. I shall not enter into a discussion on this topic, as it would form too long and obscure an episode for

my present subject. But I cannot refrain from frankly avowing, that, although in my lectures on the practice of physic, I never dwelt on the humoral pathology, yet observation, and what I will call *instinct*, have a thousand times obliged me to suspect a humour acting as a powerful, rapid, and destructive morbific principle on the living solid, displaying on the part on which it acts, the astonishing and terrible effect of a phenomenon of living animal chemistry, which will probably for ever elude our researches. Now such an agent operating upon a portion of the coats of the aorta, in altering, diminishing, or annihilating the vital and resisting force of such portion, may excite the disease of which I am treating. I will now examine concisely each of these causes, and at the same time cite some facts, which will give the history of the signs, effects, and different terminations, of this disease.

The increase of the muscular force of the heart, destroys the harmony which should exist between that organ and the aorta, (considered as power and resistance) into the cavity of which it sends the blood with too much impetuosity. The coats of the artery insensibly yield to the powerful impetus of the blood, and this ever acting cause induces the dilatation.

Before I proceed, I will notice a fact, on which, I think, observers have not sufficiently insisted: I mean the state in which the convex or upper part of the arch of the aorta is frequently found in dead subjects. It presents a kind of oblong and gradual enlargement *(bosselure)* which increases, more or less, the natural diameter of the artery. As its coats, however, in this case, are always healthy, it cannot

be considered, notwithstanding the increased caliber of the vessel, as an aneurism, or as likely ever to form one. It in no case has been known to cause death. It is found in persons of different ages and sexes, but most frequently in men; and in all cases it may be imputed to the efforts of the blood, projected by the heart with an impulse greater than the resistance. Who, in this case, can mistake the action of moral affections, the passions, and of all those muscular exertions which momentarily, and ten thousand times during life, augment the force of the action of the heart? But to return to those dilatations which have reached that degree which constitutes aneurism.

The following case contains the history of an aneurism of the aorta, which may be attributed, at least in part, to this cause.

Case 46.—A Rubber, aged 48 years, had experienced, for three months, a difficulty of breathing, which he imputed to a cold. He had been once bled for it, but without relief. He felt, besides, an inward pain between the shoulders. Hoping to find some alleviation by rest, he discontinued his usual occupation, but the violence of the symptoms soon obliged him to come into the Hospital.

The principal symptoms then were, swelling of the face, particularly on the right side, which was of a violet colour; a projection of the left parietes of the chest; œdema in the extremities; and a very great difficulty in breathing, which was high, frequent, short and whistling, the inspirations appearing never to be complete; the chest, on percussion, did not sound

on the middle and upper part of the left side. On placing the hand on the region of the heart, and even a little above, tremblings and rustlings were felt resembling the sensation which it experiences when placed upon the chest of those persons who have the rattles in the throat. The patient could not lie down or take a moment's rest.

From these symptoms, it was easy to recognize an aneurism of the aorta, of such a magnitude as to put the life of the patient in continual danger. The day after his admission, his situtation was still more alarming. He passed the day sitting with his body inclined upon his thighs. He died in the evening from suffocation.

On opening the body, I found the external cellular membrane of the chest and throat anasarcous. The right cavity of the chest contained about a pint of water ; the left about half that quantity. The right lung was œdematous ; the left, small, and pressed towards the upper part of the chest.

The pericardium contained a small quantity of serum.

The right auricle of the heart was dilated and gorged with blood ; the right ventricle smaller than natural ; the left, without being dilated, had much stronger and thicker parietes than usual. The increased strength of this ventricle, causing it to propel the blood with an unusual projectile force, accounts for the arch of the aorta becoming the seat of aneurismal dilatation ; in this case, then, the power overcame the resistance.

In fact, the arch of the aorta had become the seat of a very large aneurism, which so compressed the trachea, and formed such adhesions with it, that the fore part of its rings were flattened. The coats of the aneurism were so thin at this part, that they gave way on the slightest effort to separate them from their adhesion to the trachea. There was here little trace of the arterial coats, which appeared to be replaced by those lymphatico-sanguineous laminæ, which, in aneurisms, form successively upon the internal surface of the sac. Doubtless, if the patient had not died from suffocation, the rupture of the aneurism would have destroyed him by hemorrhage through the trachea.

The blood, in this case, entered the pulmonary artery with difficulty, in consequence of that vessel being compressed, at its origin, by the aneurismal tumour of the aorta. Hence proceeded the gorged state of the right cavities of the heart, excited also, on the other hand, by afflux of blood brought by the venæ cavæ into the right auricle. This state, without doubt, acted as an obstacle to the return of the blood into the heart, and necessarily interfered with the circulation.

From these causes, the blood, forced, if we may use the expression, to retrograde, experienced, at the same time, in the principal trunks of the aorta, and particularly at its arch, an almost insurmountable resistance. It is easy to conceive the purely mechanical effects of such an obstruction; the efforts which the blood then exerts laterally against the coats of the aorta, overcome its resistance, and cause its dilatation.

I have placed in the list of causes of aneurisms originating from derangements of the circulation, impediments situated beyond the dilated part. When speaking, in the preceding paragraph, of the obstacles to the return of the blood towards the heart, and its consequent retrocession, I fully explained how those placed beyond the dilated part of the aorta might produce these dilatations. In this case, it is the impediment produced by the united effect of the blood propelled from the heart, and that which stagnates or retrogrades in the great vessels, which gives rise to those lateral efforts which cause a dilatation of the aorta, in the weakest part of its coats; always presuming that the parietes of the heart are sufficiently strong to overcome the reaction which is made upon them; for if it were otherwise, the heart, instead of the aorta, would become the seat of dilatation.

The impediments to the current of the blood are extremely numerous; and without speaking here of such as occur in the great trunk, and its principal branches, how much do those, which arise even in the capillaries, from tumours, from spasm, or from anasarcous swellings, which, although frequently consecutive, may sometimes cause them, merit our attention!

In the second class of causes of aneurisms of the aorta, I placed whatever may excite, or even favour a certain disorganization, or weakness of the coats of the vessel, such as violent efforts, blows on the chest, excessive coughing, the metastasis of some morbific matter, or

the fixation of some acrimonious humour upon the parietes of the artery, &c.

Case 47.—A Cutter of Marble, aged 47 years, of a strong constitution, was carrying a dosser of about seventy pounds weight, when, anxious to avoid a coach which was passing near him, he stumbled suddenly backwards; he did not, however, completely fall, but rested upon one of his hands, and remained for some time in this forced position before he received assistance. He continued his labour for four days, when some difficulty of breathing came on; at the same time he felt pulsations at the upper and right part of the sternum, which induced him to come into the Hospital, on the 12th of July, 1800, eight days after the accident which appeared to give rise to this complaint.

A slightly projecting tumour was, at this time, visible on the right side of the sternum, at the place where the first portion of this bone articulates with the second. The skin, covering the tumour, had not changed its colour; pulsations could be felt, and even seen isochronous with those of the pulse, for a space of about three inches in length and two in breadth. The respiration was exceedingly difficult.

The existence of an aneurism of the aorta being ascertained, the patient was once bled, which afforded momentary relief. On the 10th day of the disease, he complained of pains in the shoulder, and numbness in the right arm. On the 11th, a second bleeding rendered the breathing more free. On the following night, if we may believe the patient, a very large tumour projecting outwardly, and compressing

the lung, shewed itself towards the left breast and arm pit. He thought he felt a fluid pass from the tumour of the right into that of the opposite side ; and at the same moment, he was seized with extreme oppression and fainting.

These symptoms soon vanished, when the left tumour disappeared, without leaving any trace of its existence. Ought we to consider the phenomenon related by the patient as real or imaginary? On the 13th day, the difficulty of breathing had diminished, but the pain in the shoulder had much increased.

I regret that I was not able to follow this case farther ; but as the complaint remained nearly stationary, the patient wished to quit the Hospital, and he left it on the 23d of July, nineteen days after the accident.

This case is interesting in many points of view ; 1st, as being caused by a violent effort, and on account of the promptitude with which the tumour shewed itself externally, which does not usually happen for some time ; 2d, from the numbness and pain in the side on which the tumour was ; phenomena most probably owing to its pressure on the nerves. The pain was moderate, and there was simply numbness, because the tumour had not acquired an extraordinary size ; but in cases where it is considerably larger, we ought not to be surprized to find the most acute pains and complete paralysis take place, which no remedy can relieve, their cause being beyond our reach. These pains and paralyses originate in causes perfectly analogous to those, which produce similar effects in the lower extremities, by the pressure of the uterus and ovaria, when in an enlarged and schirrous

state, or of lymphatic and other anomalous swellings in the lower belly.

Acute or chronic diseases of the chest appear powerfully to contribute to the formation of aneurism of the aorta, either by acting on the parietes of that vessel, by the gorged state which they excite in the vascular system, or else from the coats of the artery, partaking of the derangement of the general contents of the chest, undergoing a morbid weakening. As cases of this kind are very common, I do not think it necessary to give instances of them.

Many cases warrant the idea, that the psoraic, herpetic, scorbutic, venereal, &c. viruses, if they do not cause aneurismal dilatations, may, at least, produce a peculiar disposition to them. Innumerable facts support such an opinion; there are cases, rare, it is true, in which it is difficult not to admit a kind of aneurismal diathesis; as an example of this disposition, my memory supplies me with the following fact.

Case 48.—In dissecting, in the year 1786, the body of a man above eighty years old, for a lecture on splanchnology for the professor of anatomy belonging to the Ancient Faculty of Medicine, I perfectly well remember having found two or three aneurisms along the ventral aorta; each tumour was about the size of a walnut. There was also an aneurismal dilatation on each of the external and internal iliac arteries. I did not make any farther inquiries, or I doubt not that I should have found still more.

A case, which I believe to be one of the most remarkable of the kind, I have already quoted in page 275.

My late friend and colleague, *M. Leclerc*, assured me, that he had observed (1806) an aneurism of the external carotid, and one of the radial artery, in the same subject.

These numerous aneurisms have also been found in the arteries of the extremities.

Case 49.—I have now before me an anatomical preparation, in which the heart does not appear to have acquired a larger size than natural. The aorta, at its origin, has preserved its usual diameter, but on the anterior part of the summit of its arch, rises an aneurismal tumour larger than the fist, the base of which is attached to it for the space of about two inches and an half. The aorta before it enters the tumour is a little dilated; when it quits it, on the contrary, it appears rather contracted. Twelve or fifteen lines below the aneurismal pouch, there is, on the posterior part of the aorta, another tumour of the same nature, but much smaller, of the size and shape of a small kidney. I noticed, in the year 1802, a similar fact, the principal circumstances of which are as follow.

Case 50.—A Cook, belonging to the imperial household, aged from 38 to 40 years, of a sanguine and violent temper, had felt, for a long time, obscure palpitations in the epigastric region, with difficulty in breathing and pains in his loins, which he attributed to rheumatism.

An hydrocele of the tunica vaginalis took place in this patient, which my colleague, *M. Boyer*, cured by an operation. He appeared to enjoy good health for a fortnight after, when he died suddenly.

I found, on opening the chest, in the right side of this cavity, a red mass of coagulated blood, floating in yellowish serum, which together might weigh about six pounds. The heart was in a natural state. The arch of the aorta was the seat of a remarkably large aneurismal dilatation. The beginning of the aorta descendens partook of this dilatation; it appeared to contract itself to pass through the diaphragm, when it again dilated, and formed a tumour as large as the former. This tumour, situated upon the cœliac artery, had heaved up the aponeurotic centre of the diaphragm, which served it as a hood, and which it had worn away in two places, through which the blood had suddenly become effused into the cavity of the chest, as I have before observed.

How can the formation of these multiplied aneurisms be explained, but by admitting an organic weakness, and a peculiar predisposition to their developement in the coats of arteries, or, as I have before ventured to hint, without believing in the action of some morbid humour on various points of the arterial system?

In admitting the primary existence of the aneurism of the pectoral aorta, in the first case, and of that of the ventral, in the second, we may consider these primary affections as obstacles to the circulation, while we account for their developement by the opposition of two columns of blood, causing that fluid to make lateral efforts upon the coats of the arterial tube; but if we embrace this opinion, we must first explain how it happened that the primary aneurism was not the largest, since it had to sustain, for a greater length of time, the efforts of the blood; and how

the tumours, situated on the arch of the aorta, which, in this view, should be more recent, had acquired a volume three or four times greater than that in the chest, in the first case, and a size equal to that on the ventral aorta in the second. However, whatever opinion be adopted, it will always be involved in obscurity and uncertainty, and will tend but little to the cure of these diseases.

I have not treated in detail of the effects of contusions, which, when the aneurismal tumour appears soon after the blow, certainly operate in lacerating a part of some of the coats of the artery. In those cases in which contusions do not cause the developement of aneurism, for a considerable length of time, it is probable that the contused and injured coats may have simply lost a portion of their strength and spring, and that consequently the blood gradually dilates them.

I have classed a violent and long-continued cough among the causes of aneurismal dilatations of the aorta, which, if not alone sufficient to give rise to these affections, may, at least, tend much to hasten their progress.

I am far from thinking, that I have touched upon all the causes of aneurisms of the aorta; a volume would scarcely contain all the reflections that are excited by the history of this disease. That I might keep within the proper bounds of this article, I have been satisfied with pointing out the principal and most frequent of these causes; besides, I only intended to communicate some facts which have fallen under my observation, and particularly to indicate some points of connexion between aneurisms of the

aorta and diseases of the heart, the latter of which form the principal object of my inquiries, particularly in this work.

THIRD.

Of the Effects of Aneurisms of the Aorta.

The effects of aneurisms of the aorta may be considered under two principal points of view.

1st. The derangements which they produce in the circulation, and the pernicious consequences resulting from such derangements.

2d. The mechanical effects of these kinds of tumour.

As I shall treat of the former in the corollaries, I shall say nothing of them here, but confine myself simply to an exposition of the latter.

The mechanical effects of these tumours vary according to their position, size, form and connection with the neighbouring parts. Whatever may be the position of aneurisms of the aorta, in the thoracic or abdominal cavities, they point either externally or internally; producing, in these cases, different effects, which I shall successively examine.

In general, the mechanical effects of aneurisms of the aorta are much more supportable when they project outwardly, than when they remain hidden in the interior of a large cavity, because the compression upon the viscera is much less in the former, than in the latter case.

Aneurismal tumours of the thoracic aorta, cannot project outwardly without lifting up the solid parietes of this cavity, or at least without wearing out, even to destruction, the bony parts which oppose their developement. Some authors have thought that this destruction of the bony parts which are in contact with these tumours may arise from a corrosive or ichorous humour, furnished by their coats and not from the continued pulsations of the aneurism, or its constant pressure on these parts. But the almost uniformly sound state of the cartilages, and particularly of the intervetebral ligamento-cartilaginous substance, is surely a sufficient proof that it is not produced by an acrimonious humour; besides, the other surrounding parts would naturally suffer from their contiguity to this corrosive fluid, whereas the injury is entirely confined to the parts that are in immediate contact with the pulsating tumour.

One cannot avoid thinking that in cases of the destruction of the neighbouring bones, the coats even of the tumour must become thinner; but as *Verbrugge* has very well observed, besides their elasticity, which renders them less easily worn out, their mode of nutrition, being much more active than that of bone, repairs much more quickly the losses they sustain. If any farther proof were necessary that the want of elasticity and suppleness is the chief cause of the destruction of bones, instances might be cited in which certain bones, the clavicle for instance, have remained uninjured, because the looseness of their articulation permitted them to be dislocated.

When aneurismal tumours of the aorta remain hidden in the interior of the chest (for I

confine myself chiefly to those of this cavity) their effects vary according to their connections with the adjacent parts or organs.

The principal and invariable effect arising from these tumours, is the difficulty of breathing, the inevitable consequence of the permanent compression of the trachea, of its bifurcation, or that of the first divisions of the bronchiæ and of the lungs themselves, to which also must be added the pulling of the larynx, the flattening of the air-tube, the sanguineous choaking up of the lungs, &c. Hence also, besides the difficulty of breathing, a rattling in the throat, a hoarseness, a peculiar and very distinguishable whistling or hissing noise, and many other alterations in the voice, which deceive superficial observers, but which clearly point out that a portion of the trachea is compressed by some tumour. A deformity of this tube is one of the common results of these affections, varying much according to circumstances.

Even the perforation of this canal is sometimes observed. In which case several of its cartilaginous rings are destroyed, and when the perforation is complete, either an hemorrhage takes place by an effusion of blood into the trachea, producing immediate death, or a plug formed by a clot, is adapted to the opening, and delays, much to our surprise, that event for a time.

I once saw a mortal hemorrhage produced by the rupture of an aneurism of the aorta into the trachea. *M. Boyer* has also seen one such case. *M. Dupuytren* has seen a similar hemorrhage from the œsophagus. Similar facts are not so rare as may be imagined, and probably

many hæmoptoes and fatal vomitings of blood arise from this cause.

The compression of the great arterial and venous trunks is also one of the consequences of an aneurismal tumour in the upper part of the chest. I know a recent instance of apoplectic death caused by the compression of an aneurism of the aorta upon the extremity of the vena cava superior, the area of which was exceedingly diminished. It is not necessary to explain how apoplexy supervened in this case. A view of the circulation in general, and of the return of the blood to the heart in particular, will readily account for this phenomenon.

It is also to the pressure of a similar tumour that may be attributed the inequality of the pulse in the two wrists, the weak and almost imperceptible pulsations of the left radial artery, for example, compared with the force and fulness of those of the same artery in the right side; a phenomenon which does not exclusively belong to aneurism of the aorta, as is proved by a case already cited in this work.

I will not extend further the examination of the general effects of aneurisms of the aorta. When they occur in the cavity of the abdomen, they compress the neighbouring viscera, from whence necessarily results an alteration in the functions and secretions of these viscera, easily recognizable by the attentive observer.

FOURTH.

Of the Signs of Aneurisms of the Aorta.

The exposition of the signs of aneurisms of the aorta is reduced to a mere repetition of the signs and effects detailed in the two preceding sections.

The degree of certainty in these signs is much modified by the state of the aneurismal tumour. The diagnostic is always obscure, when the tumour is not evident to the eye or touch of the practitioner.

Where it does not project outwardly, most of the signs of aneurism of the aorta may be confounded with those of some other affections of the chest. As I have enumerated these signs, in reporting cases of this affection, I shall content myself with pointing out here, those which, when the aneurism is not evident to the eye, enable us to recognize its existence, and to distinguish it from other diseases.

I place among the pathognomonic signs, that kind of whistling already mentioned, but which cannot exist except when the tumour presses on the trachea, that is, when the aneurism is situated on the arch of the aorta. I must not, however, neglect to state that aneurisms of the arch of the aorta are not the only tumours which produce this kind of whistling: here follows a fact which should teach us a wise reserve.

Case 51.—A young Woman, endeavouring to lay hold of a kitchen utensil, which was above her head, threw that part very backward to prevent herself from falling. She felt at the moment a kind of inward tearing, at the lower part of the neck, which caused acute pain, and which continued for several days at the spot where it originated. Soon after the voice began to be hoarse, and in a short time this alteration degenerated into a complete aphony. Besides these symptoms, with great difficulty of breathing and a considerable falling away, the patient said she felt a hard substance under the sternum, to which she attributed her dyspnœa. The same kind of whistling noise in breathing was heard, that I have before spoken of, except that in this case it was rather shriller than usual. The pulse was weak, but regular. The chest throughout sounded well.

An attentive consideration of all the symptoms, and the absence of all the other signs of aneurism, induced me to suspect that some peculiar substance pressed upon the extremity of the trachea. After a considerable time, the patient, as might be expected, sunk under this affection; and I found, on opening the body, that I had not been deceived in my diagnostic: for a tumour, resembling an indurated bronchial gland, of the form and size of an almond, not only pressed on the trachea, but had actually destroyed several of its cartilaginous rings.

But to return to those signs which may, in some degree, be considered as pathognomonic of aneurisms of the aorta. Such are the peculiar rustling which is sometimes felt above the spot where the heart is naturally situated, this organ

still beating in its proper place: the obscure sound which the upper and middle part of the chest gives on percussion, the smallness of the pulse and its irregularity in some cases, and in others its inequality in each wrist; these signs are mostly peculiar to aneurisms of the aorta, or only common to them with other analogous affections of the central organ of the circulation.

I will give a case in which will be found united, most of the signs of aneurisms of the aorta.

Case 52.—A Man, aged 49 years, of a healthy appearance, came into the hospital on the 23d of October, 1798. Ten years before this period he began to feel palpitations of the heart, which returned about once a fortnight, and lasted, sometimes, for several days together. They had ceased for about three years, but his breathing was difficult, and accompanied by a sense of threatening suffocation on taking exercise. The other functions went on tolerably well.

Four months before he came into the Hospital, the difficulty of breathing had increased to such a degree that he could not lie down without a sense of suffocation. He was often even obliged to pass the night sitting in an arm-chair without undressing himself, which much contributed to produce an œdematous swelling of the lower extremities.

When he came to the Hospital, his face was rather red and swollen; the chest sounded well posteriorly, but very obscurely at its anterior and upper part. The breathing was in-

terrupted, high, laborious and whistling, and the cough was attended by a difficult and viscid expectoration. Strong, frequent, and vigorous pulsations were felt on applying the hand upon and above the region of the heart; while those of the radial, cubital, &c. arteries were weak, small, concentrated, irregular, and frequent. The urine was tolerably abundant, and of a very deep red colour.

I took away two pallets-full of blood, and prescribed squill wine, compound hydromel, and nitre. The bleeding procured a very marked relief. The breathing became less whistling, the patient could take some rest, and the pulsations in the region of the heart were less considerable, but still continued to extend towards the upper part of the chest; the pulse was less obscure, and the swelling of the legs disappeared. This amendment continued for some days, and the patient could walk and sleep tolerably well: when, on the third of November, he was seized with a violent cough, accompanied by a spitting of blood, which soon suffocated him. The blood thrown up, amounting to three pallets-full, was of a vermilion colour and contained much air.

At the time of opening the body, the mouth was full of saliva, thick but not bloody. The trachea and the larynx contained no clots, but there came out a reddish serum. The lungs were perfectly sound, and without adhesion to the pleura. A small quantity of yellow serum was effused into the left cavity of the chest. The cellular membrane under the sternum was emphysematous, the heart in a natural state, but the arch of the aorta formed a tumour double the size of that viscus, from the middle of which

arose the subclavian and carotid arteries. The pulmonary artery adhered by a firm cellular substance to the right side of this tumour. There was nothing remarkable in the aorta descendens. I could not discover in the coats of the aneurismal bag, the rent by which the blood may be supposed to have escaped.

The trachea, where it corresponded with the dilatation of the aorta, had been compressed and pushed from the left to the right, so as to take the form of the Roman letter S.

Notwithstanding the signs which I have given, and which are, in some degree, proper to aneurisms of the aorta, hidden in the cavity of the chest, many cases will still be found in which the diagnostic is uncertain; but this cannot occur when the aneurismal tumour is evident to the eye and touch of the practitioner; then the history of the causes, progress and effects of the complaint leaves no doubt as to its nature. Besides, the tumour itself offers many characters which are sufficient to indicate the disease. Pulsations may be often felt, and even seen isochronous to those of the heart; and at other times, peculiar rustlings, which can only belong to an aneurismal tumour, particularly when the heart itself is felt, at the same time, as most commonly happens, beating in its natural place.

Before I enter upon the treatment of aneurisms of the aorta, I will cite a case which comes in very properly here, as it includes almost all the effects, and the greater number of the signs of which I have spoken.

Case 53.—A Saddler, aged 38 years, having been for some time troubled with pains in

the stomach, accompanied by a disposition to vomit, obtained, by means of a simple mucilaginous drink, copious vomitings, which much relieved him, so that he continued to employ the same method three or four times with similar success. In about a year, he caught a violent cold, the cure of which he left entirely to nature; soon after, a tumour of some size appeared on the left lateral part of the sternum. At the same time, a very great difficulty of breathing, and an incapability of walking fast, without being in danger of suffocation, occurred. Doubtless, the physician whom he consulted was unacquainted with the nature of the tumour, because, after having employed several bleedings, he applied a blister to the convex part of it.

After six months rest, the tumour having entirely disappeared, and feeling only some remote palpitations, the patient found himself capable of undertaking his usual occupations.

Eight months after this apparent cure, and fourteen from the appearance of the tumour, this person was endeavouring to lift up the main braces of a carriage, when the instrument he was using suddenly breaking, he fell ten paces from where he stood. The tumour instantly reappeared. It increased so much in a few days, that he came into the Hospital, which he shortly quitted, having found some relief. He returned to and quitted the Hospital again and again, the slight relief he obtained being always followed by a still more dangerous relapse.

Finally, about two years after the commencement of this affection, the patient having violently exerted himself, and the tumour rapidly increasing to the size of a child's head, he came

into the Hospital for the last time. His respiration was then extremely difficult and whistling; he was incapable of any exertion, and was tormented with a violent cough, which incessantly endangered the rupture of the tumour.

The beatings, isochronous to the pulsations of the arteries, which were very perceptible, on touching the tumour for some days after his entrance into the Hospital, were become obscure. The surface of the tumour was wrinkled, but the skin had not changed colour. The patient could not lie on his back without aggravating the symptoms. His situation improved a little after this fourth return to the Hospital, and he even enjoyed for a month tolerable health; but at length his features became totally changed, his respiration whistling, and he could only breathe when sitting; the anxiety was inexpressible, the expectoration bloody, the pulse full, the appetite entirely lost, and the face of a deep violet colour. He was once bled, without relief. At the end of two days, during which the patient, but he alone, had indulged some hope, sudden suffocation took place.

When I proceeded to the examination of the body, the face was pale, the lips and nostrils were violet, and the jugular veins projecting. The tumour was four inches in diameter at its base, and projected two inches beyond the sternum. The skin which covered it was of a natural colour, except that here and there a vein was visible. The surrounding cartilaginous and osseous parts were very pliable. The legs were slightly anasarcous.

Having divided the cartilages of the ribs, on lifting up the sternum, another tumour was found

behind this bone, much larger than the external one. This internal tumour adhered anteriorly to the sternum, and pressed posteriorly on the trachea towards its division, and even on the bronchiæ; these different tubes were so flattened, that their antero-posterior diameter was scarcely six lines, while laterally it was at least double. The cellular substance which united the trachea to the tumour was altered, hard, and of a violet colour. The anterior edges of both lungs were united to the sides of the tumour. A portion of it was hidden in the pericardium, to which it closely adhered.

On cutting through the coats of the external tumour, they were found to be about three lines thick. Immediately underneath was a fibrinous substance, red externally and grey internally, disposed in layers, and about two inches thick. Between the clots, and a similar substance on the sides of the tumour, there was a little blood in a fluid state.

The external aneurismal bag being emptied, at the bottom of its cavity appeared a circular opening with smooth edges, about two inches and an half in diameter, which communicated with the internal aneurism, formed by the parietes of the aorta itself, so that the anterior tumour was produced probably by rupture, while the interior consisted of a true dilatation of the whole arch of the aorta. The internal surface of these dilatations was uneven, hard, and, as it were, scaly.

Beyond the dilatation, the aorta descendens, in its upper portion, had undergone no change, except that it had some blackish spots upon it, which

seemed entirely confined to the internal membrane. On the middle, anterior, and left part of the same artery there was a small aneurismal tumour of the size of a chesnut, which communicated with the cavity of that vessel by an opening as large as its base. The arteries, furnished by the aorta ascendens, were not dilated,

By the description I have given of the aneurismal bag, it would appear to be divided into three separate apartments. The first formed the tumour which projected beyond the sternum. This was separated from the second, by the projecting edges of that bone, which were, as well as the cartilages of the ribs, partly destroyed. These hard parts had no marks of caries, but were worn, and covered by a kind of thickish membrane. The second extended from the posterior surface of the sternum to the circular opening in the parietes of the artery itself. Finally, the third was formed by the cavity of the dilated aorta.

The pericardium adhered throughout to the surface of the heart; in some places the adhesion was firm, in others slight. This latter organ was much increased in size; but its cavities, and the valves of the orifices, were nearly in a natural state.

The lungs were sound, but a little gorged with blood; there was a small quantity of water in the cavities of the pleura.

The abdominal viscera were in a good state. The liver was rather larger than usual; and on cutting into it, much black blood oozed out, as generally happens in these diseases.

FIFTH.

Of the Treatment of Aneurisms of the Aorta.

If it were possible to distinguish aneurisms of the aorta at the commencement of their formation, an immediate recourse to the treatment of *Valsalva*, described at page 141, et seq. might be efficacious, and even curative; but, on the one hand, patients pay no attention to their complaint till it has made great progress; and on the other, the signs of this affection are not evident till it has become incurable.

The means which medicine offers for the relief of internal aneurisms which have reached an advanced stage, are, for the most part, purely palliative, and belong to the class of those which I shall point out for the diseases of the heart in general: I shall, therefore, defer them to the article in the corollaries devoted to that subject.

It is sufficient for me here to point out, that the most proper mode of treating aneurism of the aorta consists in a low diet, extremely moderate exercise, tranquillity of mind, frequent bleedings, putting the arms and legs into warm water; and, when the tumour projects outwardly, topical astringents, iced water, oxycrat, powder of tannin, bark, &c. applications much recommended by some old authors, brought again into vogue by the moderns, and, perhaps, too generally neglected at present.

A most useful precept, which all practitioners approve, and which cannot be too often repeated, is to avoid all strong compression on aneurismal tumours of the large vessels, when

they project externally; a neglect of this has often produced the most fatal effects.

Paroxysms are more frequently observed in aneurisms of the aorta than in any other diseases of the heart or great vessels. Although I shall presently speak of the general treatment of these paroxysms, I will here just observe, by way of anticipation, that they claim the particular attention of the physician, since by bleeding, baths, and other analogous means, these paroxysms may be speedily dissipated, which, when left to themselves, often become the cause of a more speedy death.

Section III.

OF THE RED COLOUR OF THE INTERNAL MEMBRANE OF THE AORTA.

I have frequently pointed out, in my numerous dissections, the more or less deep red colour of the internal membrane of the aorta. It extends sometimes for a considerable way, but I never saw the membrane thicker where it existed. I never pushed my inquiries farther than the aorta superior; and I have never satisfied myself as to the nature and cause of this redness. Has it symptoms which have escaped me? Is it produced by any particular humour? I cannot answer these questions.

The celebrated *Frank*, with whom I had the pleasure of conversing on this subject, at Vienna, in the year 1809, has carried his inquiries concerning this affection very far: he

has found it extend through all the arteries at the same time, and believes that it causes a fever which has hitherto always been mortal. If my memory be not treacherous, he has collected nineteen cases of it; its diagnostic is familiar to him, even in the living subject. It is important to the progress of our art, that this illustrious author should publish his observations on this subject. I trust he will not be offended at my making the result of my conversation with him known, incomplete as it is from my imperfect memory, in which he spoke with the candour and modesty which adorn his rare talents.

COROLLARIES.

I might possibly have avoided entering into the greater part of the details which will form the subject of these corollaries. All the lesions of the heart described in this work, appear to me sufficiently established by their proper signs, and demonstratively confirmed by the anatomical examination of the affected organ. But as the affections of which I am treating will be found to be more frequent, as practitioners study them with attention, and as there are many among them who still doubt their frequency, notwithstanding the multitude of incontrovertible facts, which prove it in the opinion of every candid observer, I have thought it right to fortify, superabundantly, by these corollaries, all that I have said on diseases of the heart. Moreover, they will give rise to ulterior remarks, new parallels, and particular views of certain objects connected with these diseases, and which could not well be introduced in the course of the work.

Section I.

OF THE CAUSES OF ORGANIC DISEASES OF THE HEART IN GENERAL.

An organic disease exists, in my opinion, when any organ or living solid has so far degenerated from its natural condition, either in the

whole, or one of its parts, as that its easy, regular, and constant action is thereby injured or deranged, in a manifest and permanent manner.*

I say that the deranged action must be so in a *manifest manner*; because, it is evident that organic diseases have in general struck deep root, when they are perceptible even to the most delicate tact, or by the slightest appearance of derangement in the function of the diseased organ; and this insensible progress, forms one of the greatest obstacles to the cure of these diseases. Whatever may be the sagacity of the physician, art cannot furnish the means of discovering a derangement which does not manifest itself by any sign, and consequently cannot indicate the method of treating it.

The causes which may change organs from their natural condition, are very numerous; the vital principle may resist some, but cannot overcome all; it may surmount them for a time, but cannot permanently destroy them. I say more, that the vital principle itself, the source and preserver of health, may sometimes, by its unequal distribution, by its prolonged accumula-

* By an organ or living solid, *degenerated from its natural condition*, I understand every species of alteration in its texture, in its symmetry, in fine, in its physical and chemical arrangement, which may produce disorder in its action. I think that the words *degenerated from their natural condition*, fully imply the idea of every species of alteration in the living solid, whether physical, elementary, or chemical. I am far from giving this as the best possible definition; I only wish to make myself understood, and I think it is conformable to the spirit and object of the present work.

tion upon one organ, or by its abandonment of another, become the cause of organic diseases, as well as of many others; and I do not think it inconsistent with what has been advanced in the course of this work, to assert that active or passive aneurisms may, under certain circumstances, have no other cause than this vital power being excessive in some or deficient in others. I would boldly assign this cause to an infinite number of other diseases, not organic, but disposed to become so, if it would not lead me into a long digression from my subject.

The perfect concurrence of regular action in all the organs, constitutes life and health in their most enviable degree; but each organ takes a more or less active part in the carrying on of life. When the natural activity is increased in any organ, it becomes, notwithstanding its appropriate organization, more exposed to the common law of the alteration of organized bodies from their own action alone.

Thus the continuity of the action of the heart, without example in the animal economy, may be considered as one of the principal causes of diseases of that organ: and can we be astonished at their frequency? From the *punctum saliens* noticed by *Harvey*, in the unformed rudiments of the embryo, to the *ultimum moriens*, or the impotent palpitations of the right auricle of a man, who has reached the latest period of life, this organ is incessantly in motion, pulsating milliards of times. Under this view alone, ought we not to be astonished that it is not more frequently diseased than it is? Do the different circumstances and actions of life tend to moderate its movements? Far from it: the act of parturition,

as far as regards the infant at its full time; the squalling of infancy; laughing, crying, singing; the use of some instruments; dancing, running, wrestling; exertions and attitudes of every kind; modes of dress; the use and abuse of a thousand aliments and liquors; viruses; all the arts and trades necessary to the existence or pleasures of social life; and that ever renewing and numerous crowd of moral affections, for ever operating; all conspire against the freedom and regularity of the preserving and vital action of the heart.

If the remarks I have been making are not exaggerated, they will, at least, account for the frequency of diseases of the heart, by the multiplicity of their causes. These causes may in general be divided into three principal kinds, hereditary, innate, or accidental; and the last may be subdivided into external and internal.

Hereditary.—That children may inherit the temperament, the strong or feeble constitution, the general or local vicious conformation of their parents, is a point much more universally admitted than formerly; and without speaking here of the gout, herpes, &c. it may be safely affirmed, that the germ of all organic diseases may arise from hereditary mal-conformation.*

I am thoroughly convinced that hereditary influence in diseases, is much greater and more frequent than modern physicians are disposed to admit. But I am not inclined to enter into a controversy on the subject, and will content

* By *mal-conformation*, I mean every species of actual morbid disorganization or being, or even the disposition to become so, whether in the solids or fluids.

myself with affirming, that a great number of the diseases which baffle the efforts of art, are thus successful in their resistance, because they originate in hereditary, organic or humoral, and consequently insurmountable, causes.

Galen, giving the reins to his imagination, conceived the idea of a perfect temperament; it was, that of an individual, in whom all the elementary parts of the organs were in such harmony and proportion, as to produce the most perfect general organization, and in whom also all the humours were the best possible, as well in quantity as quality. The arrangement of the solids, the course of the fluids, their connexion with each other, their action and reaction, were so ordered that there was defect in nothing, excess in nothing, but a living and perfectly acting equilibrium throughout. The idea of the perfect harmony of the functions of an individual, formed according to *Galen's* supposition, appears to be expressed with as much conciseness as ingenuity, by that Latin phrase, the source of which I have forgotten; *ex amico solidorum et fluidorum duello sanitas et vita.*

There is a wide difference between this ideal temperament and that of every living being. No one brings this degree of perfection at his birth. Every individual comes more or less vitiated into the world, whence arises some defect in the equilibrium of his functions. Some receive from their parents, organs which, on the first occasion, and with the first cause, become affected with diseases, the germ of which they inherit. Phthisis pulmonalis for example; the child born of consumptive parents, has, in the conformation of the chest, in that of the lungs,

in the minute texture and excitability of these organs, in the fluids which are proper to them, which penetrate or which pass through them, all that is necessary to dispose to consumption; sooner or later he will fall a victim to this disease, as his parents did before him.

The colour of the skin, the traits of the countenance, the physiognomy, the shape, the stature, the defects in conformation, the gestures, the habits, the propensities, the tastes, the repugnances, the sympathies, the antipathies, the voice, and the weakness and other alterations of the sight, hearing, &c.; the character too, as well as the temperament; in a word, all the physical and moral qualities are more or less transmitted from parents to children.

How happens it, that, in one family, the children, more particularly, or perhaps entirely, take the form, features, temperament, diseases, &c. of the father; while, in another, it is the mother who impresses her physical, moral, and I will add morbid qualities, upon the children? How does it happen, that hereditary qualities sometimes pass one generation without being well marked, only to reappear distinctly in grand-children? In fine, why, and in what way, do the physical, moral, and morbific resemblances, sometimes of uncles, sometimes of aunts, operate upon nephews?

How frequently, indeed, might an attentive observer see in families, children taking after both father and mother; from the one, the form, from the other, the constitution, diseases, &c. To explain, even indifferently, some of these facts, we must admit, that in some cases, one or other of the parents has a preponderating influ-

ence in generation, while in others they almost equally participate. Indeed, I am thoroughly satisfied, that if there were not intermixtures of constitutions and temperaments; if the strength of the one did not correct the weakness of the other, we should continually behold uninterrupted successions, at least for many years, of phthisical, asthmatic, and gouty persons, &c. as we should also see individuals enjoying a vigorous and unalterable health.

Let us appeal, on this point, to the opinions generally spread among the vulgar, and without placing a blind confidence in them, will it not be found that all men dread that they shall be affected with the same diseases, and die about the same time, and of the same death, as their parents? From whence could arise these opinions, so universally diffused, unless from the experience of ages?

Moreover, are not these popular notions justified by medical observation? Does not the consideration of the temperament and constitution of parents, of the diseases which they may have suffered, or to which they may have been victims, powerfully assist in enabling us to learn the temperament, the constitution, and the diseases of subjects submitted to our actual observation?

If I have taken phthisis pulmonalis as an example, it is, because this is universally acknowledged to be an hereditary disease. I might, from my own observations, and from the authority of many eminent physicians, have cited also many diseases, as well acute as chronic; apoplexies; sick head-achs; opthalmia; some diseases of the throat; many acute or chronic af-

fections of the chest or abdomen, and of the different viscera which they contain; and the greater number of cutaneous complaints; finally, I might cite diseases of the heart in particular.

Numerous facts do not allow me to doubt that these diseases are or may become hereditary. How many facts given by *Senac* and *Morgagni*, might be quoted here! I could also give many from my own observation.

The forty-seventh proposition of *Lancisi's* work on aneurisms, is entirely devoted to prove, that diseases of the heart are hereditary: he there relates that in one family, the great-grandfather, the grandfather, the father and son, were all successively affected with aneurisms of the heart. In one of the Memoirs of the Institute of Bologna, *Albertini* speaks of an old woman, who lost five brothers in the flower of their age, from diseases of the heart, and who herself had to struggle for more than thirty years against a similar complaint.

That diseases are hereditary, is no longer a matter of doubt. Many have been universally allowed to be so: and I think it is not saying too much to affirm, that the greater number should be so considered, and even some which by their nature seem the least likely: the more attention I have paid to the cases under my care, the more I have been convinced of this truth. Above all, organic diseases have this character, and lesions of the heart have too frequently the sad prerogative of being hereditary. Let us then cease to be surprized that so many diseases are incurable, which have the indelible stamp of so many generations through which they have been transmitted to us, with too melancholy an exactness.

Innate.—I might here place at the head of innate causes, as being capable of actually producing, even in the womb of the mother, or of laying the foundation of organic diseases, particularly of the heart, the intimate and immediate influence of the imagination of the mother upon the fœtus, the power and extent of which are but little known. Numerous and well authenticated facts, and the opinion of the gravest authors and those least disposed to the marvellous, render it unnecessary for me to collect here, proofs of this influence. The operation of the moral affections of the mother upon the fœtus, by means of the almost incomprehensible link which unites them, is also a fruitful source of diseases, often organic, which he brings into the world with him.

A child then may contract, in the womb, a defect of proportion, arrangement, texture, connection of organs, and certain alterations which, at his birth, or eventually, produce organic diseases. Moreover any organ may itself be sound, and yet too strong or too weak, in relation to the other organs of the fœtus: it may also be perfectly vicious, or only possess the germ of future disorganization. A child may be born with a bad stomach, liver, kidneys, the vitality or strength of organization of which is not the best possible, or not in unison with the energy or relative excess of goodness of other viscera, &c. &c.

It has been said that in this case, nature incessantly endeavours to overcome this innate cause of organic disease, to strengthen the organ which is too weak, to weaken that which is too strong; in a word, to establish an equilibrium.

But this opinion, maintained particularly by the animists, appears, evidently, systematic; impartial observation belies this exaggerated solicitude of nature, this repairing and correcting spirit, if I may so express myself, of the vital principle, and in all probability the errors of nature are more frequent and fatal, than those constant, happy and provident efforts which are too frequently attributed to her. It would not be very difficult, and it might be useful, to draw a two-fold picture; on one side, of the diseases in which nature makes salutary efforts; on the other, of those in which her efforts are unavailing and consequently dangerous, or pernicious, by their intensity and duration I know not on which side the balance would incline.

By plausible reasoning the contrary opinion might be maintained, proving that the stronger may overpower the weaker and make it its victim.

If it be admitted that nature, in all cases, employs the vital principle with forethought and discretion, even if she protects and supports the feeble organs, she cannot always defend them from the attacks of disease. If the muscular force of the heart is excessive, the coats of the aorta are no longer in harmony with it, and the dilatation of this artery ensues: on the contrary, if the heart is too feeble in its organization, it cannot completely surmount the resistance opposed to it by a more vigorously organized vascular system, and its cavities soon become the seat of aneurismal dilatation. Precisely the same will occur in the reciprocal connection of the other organs. Indeed no sensible man can deny that living bodies have peculiar laws, dependent

upon their organization, by the aid of which many of their parts, or all of them, afford mutual succour to each other in resisting morbific agents, and in banishing or destroying their effects; but that an intelligent principle, under the hitherto undefined name of nature, watches incessantly, with judgment and forethought, over the maintenance of these laws, endeavouring constantly to guide and keep them in a right direction, nothing hitherto authorizes us to conclude.

Among the general causes of which I am now treating may be placed, even in the fœtus, morbific humours, and the different viruses, which much influence the developement of organic diseases. Let us take, for example, the various kinds of herpes, which I think are very properly attributed to a peculiar acrimony. Let this herpetic humour pass from without to within, and deposit itself upon some hitherto healthy viscus, and it will soon produce organic disease. How can we otherwise explain those indurations, those internal schirri, manifestly originating in some repelled morbific humour? To what other cause can be attributed many diseases of the heart, erosions of the interior surface of viscera, of vascular tunics, of peculiar spots upon their internal membranes, the erosion of the internal coat of the intestines in some kind of fevers, &c. the more than probable consequence of the repulsion, metastasis, or the stay of some unknown acrimonious humour, or even bilious, psoraic, herpetic, venereal, &c.

I might insist still more on the humoural causes of organic diseases, if it would not lead me beyond the limits I have prescribed for myself: causes too much rejected in our days, the

frequent existence of which I think I have proved in my lectures, and to which every candid physician must confess that he is frequently obliged to recur in the practice of his art.

External accidental.—The list of the external causes of organic diseases is extremely extended. Blows, falls, wounds, contusions, running, wrestling, dancing, playing on wind instruments, &c. the abuse of spirituous liquors, sensual indulgencies, illusions *(erreurs)* in sleep, watchfulness, rest, exercise, &c. are so many causes which may excite the developement of organic diseases of the heart or of other parts.

A blow, on the upper part of the sternum, may not only excite an alteration in that bone, but also a disorganization, or peculiar weakness, in the coats of the aorta at its arch, which may soon give rise to an aneurismal dilatation. A blow, lower down, may cause a mortal disease of the heart, even in the strongest man; of which there is a striking example in this work. Is not a cicatrix, in consequence of a wound, a disorganization of the skin? The same circumstances take place internally: thus a wound of the lungs, liver, or spleen, leaves a change in the organization of these parts, which, however slight, may become the cause of a more serious organic disease.

Singing, crying, running, efforts to lift heavy burthens, wrestling, leaping, &c. are, I repeat it, frequent causes of organic affections of every kind. Many aneurisms of the aorta and heart, and other diseases of these parts, evidently originate in some one of these causes. It is not uncommon for persons who cry things about the streets, to die of laryngeal phthisis: in fact, all the

professions, arts, and trades, expose a great number of those who follow them, to organic lesions. Many cases scattered through this work attest the truth and frequency of these causes.

Internal accidental.—The influence of the atmosphere, of seasons, and places, excites endemic, epidemic, sporadic, intercurrent, &c. diseases: all, or almost all of which, may become the cause of organic affections.

At the head of these internal causes may be placed the act itself of life. I have before said, that there is no such thing as a perfect temperament: that we have all organs, some too strong, some too weak. These organs not being in a state of reciprocal action, and in a just equilibrium of connection, derangements will necessarily ensue; first in the functions, and then in the organs which are the agents of those functions. It may then be affirmed, that from the mere exercise of life, individuals, without committing any errors or excesses, will only live for a certain number of years. Have we not a striking example of this in persons attacked with hereditary consumption? By wise precautions, and careful management, their existence may, perhaps, be prolonged for one or two years, or perchance a little more, but in spite of every thing, they always perish in the flower of their days. Thus also a heart, a stomach, a liver, too weak or too strong, in relation to the rest of the system, or ill formed, will perish, if it may be so said, prematurely, and yet it will have lasted its time.

To perceive and acknowledge these truths is not to injure the credit of our art: on the contrary, it is making a good use of our knowledge to

employ it in appreciating the results of organization: but art cannot go beyond the means which nature has permitted; it is then redressing and not limiting or contracting her, to affirm that she cannot cure every thing.

What has been said is, I think, sufficient to prove that even in natural organization the mere act of life is the cause of death, after producing, very frequently, organic diseases. It has long been said, that the first day of life is the first step towards death, but in a much more abstract sense than I am saying it here. Moreover all the causes of the affections of which I am speaking are not evident; there are some unknown causes which spontaneously develop diseases.

In persons apparently well formed, a disease of the heart, or some other organ develops itself without any perceptible cause, external or internal, and without the profession, accidents, or moral affections, having excited it. It is impossible to prevent these, and they are generally, cæteris paribus, the most difficult to treat. For how is it possible to direct a treatment against an unknown cause!

Acute diseases frequently become the causes of organic diseases, not only of the part which has been the seat of the acute affection, but even of neighbouring organs. It is thus that phrenitis leaves a disorganization of the meninges of the brain, whence arises loss of memory, imbecility or madness; pleurisy, adhesions to the costal pleura; pericarditis, the adhesion of the pericardium to the heart, &c. Thus peripneumony may produce aneurisms of the heart, which form, either from the blood being impeded in its cur-

rent, or because the inflammation being propagated to the heart itself, this organ is thereby weakened.

Among the causes of this kind, chronic diseases perform a still more important part, because their effects are more durable and constant. Thus asthmas, pertussis, all long and obstinate coughs, and every natural or morbific derangement in the respiration, may excite dilatations of the heart or great vessels. In fact, whether these derangements of the respiration be produced by a sanguineous or serous state of distention, by debility, an habitual or periodical nervous constriction of the pulmonary organ or its different tissues, there always results an almost insurmountable obstacle to the heart's impelling the blood through the pulmonary capillary system, rendered inert by the disease of the lungs, and perhaps also by the changes which this system has secondarily undergone. Hence a dilatation of the heart is a frequent consequence of all kinds of asthmas, ill-cured acute peripneumonies, chronic peripneumonies, and even some consumptions. It would not be then a bad nosological division of these diseases, to distinguish them into *primary* and *consecutive*.

But of all the causes capable of producing organic diseases in general, and especially those of the heart, the most powerful, beyond contradiction, are the passions. There exist in man, two principal centres, where all the passions, of whatever nature, chiefly operate and concentrate their effects. I mean the heart and the centre of the epigastrium. Hence originate so many of the diseases of the principal viscera of the abdomen, which will be found, on observation, to

be more frequent after the middle period of life, but which do not form a part of my subject: hence also various diseases of the heart and large vessels, at all ages. In fact no passion can be experienced without the motions of the heart being increased and accelerated, slackened, weakened, or disturbed, without its energies being exalted, reduced or nearly annihilated; pleasure, pain, fear, anger, in short, all the acute passions cause it to palpitate, to beat more or less frequently, strongly, or regularly, to suspend its actions for a moment, sometimes for ever. The unexpected news of his reprieve, strikes with death the criminal who was about to be executed: a lover dies at the moment when his wishes were about to be satisfied; fear destroys one individual, a fit of anger, like a thunderbolt, another: the passions in this person are less vehement, he yields to the gloomy affections, less vivid, but more durable; the action of the heart, in him, is not suddenly paralysed, as in the former, but because it alters but slowly, the organic disease is not less the consequence.

The calamitous events, the bloody scenes of the revolution, the loss of property, the arrests, the emotions and grief occasioned by them, have furnished, in our time, ample proof of the influence of the passions in exciting organic diseases in general, and those of the heart in particular. How many persons once opulent, but then reduced to beggary, have been seen in hospitals praying for speedy death, as a termination to their miseries, and which an organic disease of the heart was drawing on too slowly for their wishes.

Section II.

OF THE SIGNS OF DISEASES OF THE HEART.

Although the signs which indicate diseases of the heart, are to be found in the phenomena of the circulation, or respiration, still there are other points deserving the attention of the practitioner, in as far as they may throw considerable light upon the diagnostic of these affections. Thus a knowledge of the *facies propria*, in these diseases, is so important, that in many cases it alone points out the existence of a disease of the heart or its appendages, leaving to ulterior investigation the particular species of lesion.

That nothing may be omitted in the history of the signs which I am about to give of these diseases, I think it right to follow nearly the same order which I have done in treating on the signs of aneurism. I will then consider, 1st, The expression of the countenance, the external examination of the body, and the means which may be employed externally to ascertain the existence of diseases of the heart: 2d, I will examine, in detail, the various derangements perceptible in the circulation: 3d, Those in the respiration: 4th, I will take a rapid view of the state of the digestion: 5th, I will speak of the influence of the diseases of the heart upon the secretions and upon the functions of the brain.

FACIES PROPRIA, EXTERNAL STATE AND EXTERNAL MEANS OF DIAGNOSTIC.

The countenance, the physiognomy, in fact, the *facies propria* is, in my opinion, the surest guide by which the experienced practitioner can ascertain a great number of acute or chronic diseases: but it is particularly in those of the heart, that this sign should be attentively considered; because, I repeat it, that many of them may be distinguished by it alone.

When an organic disease of the heart has made but little progress, the countenance does not always present any very well marked characters: such as might be pointed out, may, generally, be confounded with those which merely announce a predisposition to these affections. Thus, in sanguineous persons, sudden and transient flushings of the face, accompanied, particularly in females who are not regular, by a sensation of constriction about the throat, difficulty of breathing, slight and frequent palpitations, are signs which announce the beginning of a disease of the heart, or mark a plethoric state very likely to favour its formation. Often too in women, and sometimes even in men, this state is purely spasmodic, and requires a much longer period than it usually lasts to give root to an organic lesion.

But when the disease has made some progress, the *facies propria* is proportionally expressive. In general the face is bloated and suffused *(vultueuse)*, but not exactly as it is in acute diseases; there is the same increase in

volume, but less alteration or decomposition in the features. The face is generally of a deep red approaching to violet; the venous system alone might be said to be injected: the nose and lips have this violet tint in a more marked degree. It is, however, right to observe, that the face does not in all cases assume this appearance; the lymphatic constitution of some persons causes it to preserve a paleness, added to the usual bloatedness; in others also, the organic disease, though very serious, is too recent for this bloatedness of the face to have come on; but the complaint is even then clearly characterized by a peculiar alteration or decomposition of all the features.

The diagnostic is not less dependent upon an examination of the rest of the body. Thus, the gorged state of the general venous system, often decidedly marked on the surface of the body; that of the jugular veins in particular, which are sometimes very prominent; their pulsation, which may be observed, and which is frequently confounded with that of the subjacent carotid arteries; the character of the beatings of the heart or large vessels, which are visible to the eye in the region of that organ, in the neighbouring parts, above the sternum, in the right side of the thorax, or towards the epigastrium; the irregularity of these beatings; a sort of rustling, and a particular disturbance in the circulation, when there is a contraction of the orifices; the state of the parietes of the chest, which are sometimes more rounded and projecting than is natural, and seem lifted up continually, or at intervals, by a body contained in the cavity which they surround; the tume-

faction of the belly, caused by an effused fluid; the gorged state, and sometimes manifest enlargement of the liver, evidently produced by the difficulty which the blood experiences in entering into the heart; and the anasarcous swelling of the extremities, are so many symptoms which assist in directing the researches of the practitioner, and putting him into the right path for discovering the true nature of the disease.

Among the external means of distinguishing affections of the central organ of the circulation, percussion of the chest holds a distinguished place. This method, which I have successfully used in a variety of cases has been peculiarly useful to me in ascertaining the healthy or morbid state of the organs of the circulation. Such, indeed, is the degree of precision to which it may be carried, that I have often been enabled to determine with exactness the degree of dilatation of the heart, by measuring it, if I may so speak, by the extent of the parietes of the chest, in which no sound, or only an obscure one, was afforded. How often after death have I been enabled to verify the truth of the diagnostic which I had derived from percussion!

This method, recommended by *Avenbrugger*, under the name of *percussion*,* consists in striking the chest with the ends of the fingers united; in which case, if the lungs are sound, full of air, and if no foreign body, either solid

* I have published a translation of *Avenbrugger's* work, with an extensive commentary; and I think it may be consulted with advantage.

or fluid, occupy the interior of the thoracic cavity, the sound produced by the percussion has been compared (an exaggerated comparison) to that proceeding from an empty barrel when struck. Where, on the contrary, a solid or fluid body fills one of the cavities of the thorax, or both, the parietes give, to the extent so occupied, a sound which has been characterized by the term *(mat)* dull, and which is said to resemble that excited by striking the thigh in the same manner, or with the flat of the hand. The sound produced by percussion in some diseases of the heart, is but little less than in a natural state, and is then the index of a less decidedly morbid state of the viscera within. The knowledge of the degree of sound which denotes the perfectly healthy state of all the organs of the chest, can only be acquired by practice; and it is that alone also which enables one, in some sort, to judge of the solidity of the body which prevents the chest from sounding at all; but in forming a judgment, every allowance must be made for the natural thickness of the integuments, and for the very frequent anasarcous state of these parts, which have, in many cases, led to the belief that the chest sounded badly, when it was entirely owing to these circumstances.

The precision of this method being acknowledged, one cannot but feel surprized, that notwithstanding the satisfactory results which it affords, it should be put into competition with what has been lately proposed under the name of *abdominal pressure.* If the celebrated *Bichat,* the inventor of this practice, had not been too hastily snatched from medical science, of

which he would have one day been the ornament and glory, he was endowed with too solid and just a spirit of observation, not to have admitted, after farther experience, how treacherous is this method, particularly in the organic lesions of the heart.

The author of the "Memoir on Abdominal Pressure" says, that when the epigastrium is pressed from below upward, the patients experience the same agonies, as when they place themselves in a horizontal position; the stifling increases, according to the degree of pressure; the pulsations of the heart become stronger, and the lividity of the lips and other parts of the face more considerable. If these, as pointed out by that author, were the certain and constant effects of abdominal pressure in cases of aneurism of the heart, it would be decidedly useful; but impartial observation does not give the same results.

This pressure, so far from increasing the anxiety and exasperating the symptoms in all cases, is, to many persons, a source of relief, as long as it is continued. This assertion is so decidedly contrary to that of the author of the Memoir, that I think it right to support it by the authority of *Morgagni*, who cites, in Letter 27, No. 13, two cases of aneurism of the heart, as recognized after death in two subjects, who had found relief from strong pressure on the abdomen, or even on the chest itself.

Moreover, according to the theory of abdominal pressure, how can we account for the relief which many persons, affected with organic diseases of the heart, find, in sitting night and day inclining forward, so that the abdomen presses

upon the thighs : does not this position produce a true abdominal pressure, stronger and more continued than that which can be obtained by the proposed means? It is, nevertheless, the attitude which many patients prefer, and keep continually, as it alleviates their pain, and affords that rest which every other situation denies them.

Some patients, it is true, experience when their stomachs are loaded with food, more difficulty of breathing and general uneasiness ; but this is far from being uniformly the case ; and I have seen persons, labouring under diseases of the heart, whose symptoms were decidedly relieved by a full stomach. I remember being consulted many years ago, by a patient afflicted with one of the best marked of these diseases which I have ever seen, who found great relief, from his otherwise insupportable symptoms, by loading his stomach with food. Perhaps it may be said, that, in this case, the weight of the stomach dragged the diaphragm lower; but I have not the slightest doubt, from the quantity of food taken, that the stomach pressed the diaphragm towards the chest, thus diminishing its cavity, standing in lieu of abdominal pressure, and producing effects contrary to those which have been announced.

However, I do not pretend to deny, that by pressing the abdominal parietes towards the chest, or by what amounts to the same thing, narrowing its cavity, the freedom of the respiration is diminished ; it is merely because the same phenomenon may be observed in a healthy, as in an unhealthy person, that I consider it as insignificant, and that its effects are not

sufficiently distinct and clearly marked to be admitted into the list of signs of organic diseases of the heart. I have often, by the bedside of patients, convinced myself of the truth of what I have said in the foregoing paragraphs. Besides, there is frequently great difficulty in putting this method into practice, as well from the anasarcous swelling of the parietes of the abdomen, as from the enormous distension of that cavity, by the fluid effused in it, particularly in an advanced stage of the disease, and which effusion itself produces a kind of perpetual abdominal pressure.

State of the Circulation.

Most of the derangements in the circulation caused by diseases of the heart, announce themselves externally, by phenomena manifest to the sight or the touch. I could not avoid speaking of many of them in the preceding article, but having only pointed them out, I shall now enter into a detail, which in that place would have been improper.

The alteration in the functions of the organ of the circulation, may be ascertained either by examining the heart in the region which it occupies, where its beatings more or less regular, and its strong, weak, regular or tumultuous palpitations, may be felt, or by inquiring into the varied characters of the pulse, in the different branches of the arterial system.

It is necessary here to distinguish those palpitations, oppressions and flutterings of the heart, which are only perceptible to the patient, from those pulsations which are more or less manifest either to the touch or sight of the observer. The former are frequently the effects of a prejudiced imagination, while the latter often confirm the existence of one of those diseases of which I have treated in this work. In a word, the one denote, in the greater number of cases, a transient spasmodic affection, while the others are true symptoms of a permanent organic lesion, always of a very serious nature.

On applying the hand to the region of the heart, the series of its dilatations and contractions is found not to be in a natural order; its pulsations offer a crowd of varieties, more numerous even than the species of lesions which they indicate. Thus in dilatations in general, the pulsations are usually felt for a considerable space on the parietes of the chest: sometimes they may not only be felt, but even seen, as far as the epigastrium, and this is doubtless the phenomenon which has been often taken for the pulsations of the cœliac artery, of the aneurismal dilatation of which so much has been said and so little observed. In simple active aneurisms, the pulsations of the heart are frequent, strong, vigorous, vibrating and regular; they strike the hand with a hard and violent stroke. In simple passive dilatations, these pulsations, although equally diffused, are softer, and slower, but not less regular. In cases of contractions of orifices, of induration or ossification of the valves, &c. they are, for a moment, strong, sometimes weak, almost always intermittent, irregular, undulating,

rustling or trembling, all the varieties of which it is impossible to describe. When there is any morbid change, whether of a fatty or osseous nature in the fleshy substance of the heart, or a softening of its fibres, the usual consequence of carditis, &c. its pulsations are always feeble, slow, and for the most part insensible, &c.

I think it right to notice here, that to be enabled properly to observe these various characters, the heart must be felt in the absence of those palpitations, which are common to almost all diseases of that organ, or a due allowance must be made for them: without this precaution, the examination of the region of the heart will afford but treacherous results.

The touch is not the only sense by which the disordered beatings of the heart may be ascertained, for they are often evident to the eye. They are sometimes even visible to a considerable extent, but still the eye is less to be relied upon than the touch. It is true, that by the sight, those beatings and palpitations may be ascertained, which may be considered as general signs of diseases of the heart; but by the touch, the particular characters of intermission, irregularity, rustling, trembling, undulation, force, weakness and inequality are known, and it is by these peculiar phenomena that a precise diagnostic may be formed.

Some authors have asserted that they have heard, even at a considerable distance, the noise produced by the beatings of the heart, in some diseases of that organ. I have never had an opportunity of verifying this doubtless rare occurrence, but have only heard its pulsations on

bringing the ear near the chest of the patient.

The pulse, even in the first stages of diseases of the heart, offers some peculiar characters, either alone, or in comparison with the nature of the pulsations of that organ.

Thus the strengh, hardness and vibration of the pulse, when greater than is warranted by the constitution of the patient, are tolerable signs of aneurism with thickened parietes; while its weakness or softness, greater than might be expected from the general state of the individual, may, at an early period, be considered as marks of passive dilatation, particularly when it does not correspond with the extent of the pulsations of the heart.

Thus also trifling inequalities and slight irregularities of the pulse, with transient palpitations, lead to a suspicion of an incipient ossification, contraction, &c.

If these inequalities and irregularities are added to the frequency and immoderate strength of the pulse, they afford well-grounded reason to suspect the co-existence of active aneurism with a contraction of one of the apertures; unite on the contrary to these irregularities, weakness and softness of the arterial pulsations, and they give an indication of passive aneurism, complicated with some contraction. If to these different signs, be finally added, a consideration of the *facies propria*, the dyspnœa, the cough, the sense of suffocation in walking or riding, starting out of sleep, and œdema, the consequence will be a faithful epitome of the general and particular signs of the principal diseases of the heart.

Although the different stages of these lesions are merely marked by the different intensity of

the symptoms, yet when the disease has reached that stage, which induces persons to apply to hospitals for relief, I dare affirm, that a physician may, even with his eyes shut, find in the pulse sufficient to fix his attention upon the kind of lesion, and to enable him to detect the morbid state of the principal organ of the circulation.

The pulse then is to be found in all its possible states, in diseases of the heart. It is strong, hard, vibrating, almost always frequent, and regular in simple active aneurisms: soft, slow, often frequent, regular, and easily suppressed in passive aneurisms: irregular, unequal and undulating in all cases of permanent contractions: intermittent, regular and irregular at intervals where the contractions are momentarily produced by excrescences, soft concretions or other analogous alterations; weak and scarcely perceptible, in indurations, ossifications, the softening and other morbid states of the muscular tissue; quick, frequent, disordered as though convulsive, and impossible to be described, in cases of rupture of one or more of the fleshy pillars.

What infinite variety must the different combinations of several of these affections give to the pulse! It is not long since I gave some instances of this: it is impossible to describe them all: it is from practice and experience alone that they can be learned; there is besides almost always a something which does not exist in the healthy pulse, and which is better felt than described. Among many individuals attacked with these complaints, there is not one, in whom the pulse does not offer a difference, either in strength, weakness, irregularity or ine-

quality. There are some very rare cases, in which, although the disease be very well marked, the pulse preserves its regularity to the end; it is then by attending to certain other symptoms, that we must gain a precise knowledge of the disease, and ascertain the absence of contraction, ossification and every complication.

From the mere state of the pulse, from its various characters which I have been pointing out, and particularly from its constant irregularity, is it possible to establish the diagnostic of an organic affection of the heart? I hesitate not to answer in the affirmative, where the disease has made some progress; I think I may go still farther and say, that the action of the heart is so essentially disturbed, even in the beginning of affections of that organ, that in examining with care at this epoch, the phenomena of the pulse, signs may be perceived of the disease, even in this its first faint outline; but when once confirmed, they are alone sufficient to point out its existence to the enlightened and attentive physician.

One of the most singular characters which the pulse offers in some diseases of the heart, is, its difference in the two arms, or its being perceptible in the one and not in the other. It is astonishing that practitioners have not been struck with this peculiarity, when in examining the pulse of a patient in each arm, they have found it strong or weak on one side, and quite different on the other; perceptible, for instance, in the right wrist, and not to be felt in the left. A physician is consulted for a supposed asthma, dropsy of the chest, or some other acute or chronic affection; he notices that the pulse is

not the same on each side, and the patient tells him that this has long been the case; the disease becomes diminished, but the characters of the pulse remain. Does it not, in such case, point out an organic affection of the heart or large vessels?

I know that this may sometimes arise from an obliteration or ossification of an artery, of which I have given one instance; but it will generally be found to depend upon an organic lesion of the heart or great vessels, as the following observations prove.

1. An aneurismal tumour of the heart or large vessels, may be so situated as to press upon one of the subclavian arteries, and prevent the usual quantity of blood from flowing into it, or almost totally to obliterate its area.

2. I have seen in more than one aneurism of the aorta, the mouth of these arteries contracted by the swelling of the internal surface of the coats of that vessel, and of the circumference of the arterial orifice, which may itself, perhaps, be in a state of ossification. I will make one remark on this subject; it is, that the arteries which rise from the arch of the aorta, very rarely participate in the disposition to be dilated, when this spot is the seat of an aneurismal tumour, but are often so much compressed by it, as to weaken, and even destroy, the pulse in one arm, and that generally the left.

3. I have lately seen a person affected with aneurism of the aorta, in whom the want of pulse in the right arm was owing to a kind of hard and cartilaginous valvular spur, situated forward in the aorta, and which, by its direction, turned the whole of the column of blood into the ca-

rotid, and prevented its entrance into the subclavian artery of that side. I shall give this case, when I speak of the usual course of diseases of the heart.

The suppression of the pulse may also be owing to the obliteration of the radial artery, or to its complete ossification, which may be ascertained by the touch, to its deviation or some other anatomical variety; but these cases are very uncommon, and this singularity of the pulse is mostly owing to an affection of the heart or great vessels, among the least equivocal signs of which it may be placed.

State of the Respiration.

If the constant derangement in the phenomena of the circulation, a knowledge of which is acquired from the pulsations of the heart and arteries, furnishes a series of signs, pathognomonic of diseases of that organ, the state of the respiration, the disturbance observed in that function, considered alone, afford but equivocal signs of these affections, as they are in general common to many diseases of the chest.

We shall have an opportunity of seeing in one of the following articles, what are the points of resemblance in almost all diseases of the chest, and which have caused affections of the heart to be confounded with some other complaints, to which I shall compare them, chiefly with the view of pointing out those means by which they may be distinguished.

Some diseases of the heart form hastily, others slowly. In those which form suddenly,

from a violent effort or blow, an acute moral affection, and even, though very rarely, without any known cause, &c. the respiration is sensibly altered at the moment when the cause operates; and often the difficulty of breathing is the first symptom which announces the approach, and perhaps, immediate formation of a disease, which, in an instant strikes, apparently, its first roots.

It is not thus with those organic affections of the heart, the formation of which is slow or imperceptible; in this case, the signs, although always very obscure in the beginning, may, perhaps, be caught by a high degree of penetration.

When the disease has made some progress, the derangements in the respiration display themselves and gradually increase. A slight, but habitual difficulty of breathing then exists; and as soon as the patient quickens his pace, he is obliged to stop, as he can no longer breathe. The same symptoms are frequently brought on if his business be a laborious one, or if he endeavour to walk up rising ground or up stairs. It appears to the patient as if there was no longer a due proportion between the quantity of air taken into the lungs by inspiration, and the capacity of those viscera. He endeavours in vain to breathe more freely; he hurries his inspirations; the breathing is then difficult, high, short, and interrupted.

To these different states of the respiration, may be added a sort of whistling, of which I have spoken when treating of aneurism of the aorta, and which more particularly points out this latter organic lesion.

Persons affected with organic diseases of the heart, cannot breathe while in bed equally well in every position. It is immaterial whether they lie on the left or right side. Sometimes it is more easy to lie on one side than the other; but this does not appear to take place more as to one side than the other. The patient generally breathes most easily when sitting, inclining his body backwards, and bending the trunk so as to project the anterior part of the chest forward. It is in this forced attitude, that he is sometimes enabled to procure sleep. However, this is not the only position which is favourable to respiration, for persons affected with these same diseases, often take one nearly the reverse; they lean forward, the abdomen supported upon the thighs, and the chest approaching the knees. I have seen some patients retain this position for many days together, it being the only one which they could preserve with comfort.

It may be thought that the difficulty of breathing in diseases of the heart, is owing to the mechanical compression of the pulmonary organs, from the increased volume of that viscus, or from the developement of an aneurismal tumour; this may be true in many cases, but in the greater number it appears to arise solely from the accumulation of blood in the vascular system of the lungs, and from the difficulty which that fluid experiences in entering the cavities of the heart, totally or partially degenerated from their natural organization.

Of the State of the Digestion, the Secretions, and the Functions of the Brain.

That I may exactly follow the course which I have chalked out for myself, it is necessary, in completing the history of the general signs of diseases of the heart, to speak of the state of the digestion, the secretions and the functions of the brain: but when treating of the signs of aneurisms of that viscus, I went very much into detail as to the alteration which these various functions undergo in the different stages of its diseases; and having nothing new to add to what I there said, I refer my reader to section the first, chapter the third, of class the second. The change in the functions of the brain arises from three causes; 1st, its gorged sanguineous state; 2d, serous effusion; 3d, the change in the arterial blood, which has become black, and consequently can no longer produce the same excitement. I shall be obliged again to recur to these different points in the following section, which is naturally linked with the present.

Section III.

OF THE USUAL COURSE OF DISEASES OF THE HEART.

The history of the course of organic diseases of the heart, should include their beginning, their developement, their height, and their ter-

mination. But the period, during which they pass through these stages, is, sometimes very long, sometimes very short. Organic diseases of the heart might then, with strict propriety, be divided into acute and chronic.

Carditis, and *pericarditis*, should be placed in the class of acute diseases; but still they cannot be properly called organic, because they only become so in consequence of peculiar changes which they excite. But certain partial ruptures, resembling those of which I have given an instance, may be ranged in this class.*

I have lately even seen a man, aged about 76 years, sink under a disease in fourteen days, having all the signs and symptoms of an organic affection of the heart, who had never before had the slightest indication of such a complaint.

I have also seen, since the publication of the first edition of this work, a man, about 55 years of age, who had always enjoyed good health, lived a most regular life, and whose passions were of the most moderate kind, suddenly attacked with an organic affection of the heart, attended at once by the best marked and most serious symptoms, and under which he sunk in about five months.

Among the number of chronic affections, may, doubtless, be placed almost all those of which I have been treating; because, developing themselves slowly, they do not terminate for a very long time after the cause which first excited them took place.

* At any rate, the word *acute* should apply merely to the quickness of the attack and the rapidity of the progress, and not to the inflammatory nature, &c. of the disease.

Those diseases of the heart which I have ventured to call acute, follow the usual course of acute diseases in general, with this difference, that their attack is more alarming, their progress more rapid, and their termination more fatal, from the nature of the organ affected, or rather from the disturbance and subversion excited in its functions.

Those which have a slow and chronic course, are much more numerous ; and it is this slow course which I am about to describe in this section, and of which numerous instances are given in this work.

From all that I have said on the signs of diseases of the heart, it must have been noticed that those signs, in most of the organic affections of that organ, are least certain in the beginning, and consequently, at that time, throw the greatest obscurity on their diagnostic and progress.

If the disease be hereditary, and, above all, innate, the individual is from infancy troubled with the common and primary symptoms, palpitations, difficulty of breathing, &c. These individuals rarely attain a mature age ; some even only live a few days ; but it is almost always between the age of twelve and sixteen, that they sink under a complaint, which they brought with them at their birth, and which developed itself in their earliest infancy.

When the disease is not innate or hereditary, its developement, usually favoured by the natural constitution of the individual, takes place insensibly or more quickly from the action of some incidental cause, either moral, as fear, grief, anger, &c. or physical, as a violent effort, a contusion, a disease of the lungs, &c.

Whether the disease forms insensibly, and without any apparent or known cause, or in consequence of one that is evident, the primary symptoms consist in the disordered functions of the circulation and respiration. It is usually in walking quick, or during a violent exertion, that the complaint gives the first indication of its developement or existence. Thus, a person, in other respects in health, shall, in walking, or taking any other exercise, be suddenly stopped by a sense of suffocation, preceded, accompanied, or followed by more or less violent palpitations. These symptoms go off suddenly, and leave the patient in a state of apparent health, until under the same circumstances, and often from the same exciting causes, the same symptoms are reproduced.

After two or more attacks of this kind, which the patient commonly looks upon as slight indispositions, he often enjoys, even for a long time, so good a state of health, that he would entirely forget these primary inconveniences, if they were not sooner or later renewed, and did they not go off a second, or even a third time, only to return with greater violence, and from analogous but slighter causes.

However, at this period, the disease, although more advanced, appears concentrated in the organ affected; as yet, there is no change in the solids or fluids; no farther disturbance is introduced into the functions of the animal economy. And so far is any idea from being entertained of a general disease, that the appearance of the body, far from announcing the developement of some mortal affection, seems to carry with it the seal of robust health, in the vigour of

the limbs, the general embonpoint, the colour of the face, the increased digestive powers, &c. particularly in active diseases. But soon those symptoms, which the patient regarded as transient indispositions, are renewed with greater force and frequency; the countenance, already suffused, becomes still more so, and is bloated, and of a deep red colour; the lower extremities swell, particularly on standing, but go down in the night. The patient seems in a middle state, between health and disease. The duration of this unsettled state, will depend upon the vigour of the constitution of the individual, his profession, his moral affections, and all his actions.

After some time, fresh symptoms are added to those already mentioned, which are themselves become stronger, such as sleep disturbed by frightful dreams, the patient imagining that he is on the edge of a precipice, followed by assassins, &c. waking with starting, the nightmare, an increased difficulty of breathing, pulsations of the heart; frequent, hard, and violent, in active aneurism; soft and diffused, in passive; irregular, when the disease arises from contractions and ossifications; unequal, intermittent, and very variable, in cases of rupture of the fleshy pillars, or of excrescences and floating concretions; feeble or insensible, when the muscular substance is softened, converted into fat, or ossified. The characters of the pulse correspond nearly with those of the pulsations of the heart.

Such are, for the most part, the symptoms which distinguish the second stage, to which succeeds a state every day more grievous. This third stage is marked by an increase of all the symptoms, and particularly of the serous dia-

thesis, which had merely announced itself in the second stage, by a swelling of the lower extremities; this is now followed by anasarca in all the extremities, and even the integuments of the whole body. It sometimes increases to such a degree in the lower extremities, that cracks take place, which give vent to a great quantity of water. The serous diathesis is then so well established, that all the serous cavities become the seat of effusion. Thus the thorax and abdomen have more or less water in them, which may at first be evacuated with tolerable facility by the means which I shall indicate, but which, eventually, defy all the efforts of art.

The period during which persons remain in this state, is uncertain. But after many alternations of better and worse, the patients become incapable of motion in almost all cases, the body bent forward, or in some other forced attitude, the face bloated and violet, the lips blackish, the features altered, the eyes often hid by the swelling of the eye-lids, the respiration short, interrupted and nearly impracticable, the cough continual, with spitting of blood or abundance of mucus, the parietes of the chest and belly swollen and distended by the water which they contain, the arms and legs deformed by œdema, the pulse unequal, irregular, very intermittent, vacillating and nearly imperceptible. Sometimes the patients are in a slight delirium, at other times in a sub-apoplectic state, seldom dying in consequence of the rupture of an aneurismal tumour, but usually from sudden suffocation and occasionally in lingering agony.

Such is the usual course of the affections, the history of which I have been detailing; there

are some instances which, (although the disease passes through nearly the same stages) are marked by such regular paroxysms that they may be confounded with certain complaints which come on periodically, as is the case with asthma. To enable the reader to catch the points of resemblance between these affections, I will cite the most singular instance of aneurism of the aorta which has come under my observation, the symptoms of which had much analogy with those of spasmodic asthma.

Case 54.—A Terrace-Maker, 56 years old, of a bilious temperament, had enjoyed good health till his fiftieth year; he was then attacked with a periodical discharge of blood by the anus, lasting for two or three days, and recurring every month, preceded by very acute pains in the abdomen, which ceased as soon as the discharge took place.

Fifteen months before this patient came to the hospital he had fallen from an height of six feet, which caused an acute pain in the right side of the chest; but it did not last long. In the course of 1803, he was affected with a catarrh then prevalent at Paris. After he recovered from this complaint, a troublesome cough remained, which tormented him ever since.

Five months before his admission into the Clinical Ward, he was attacked, while walking, with so great a sense of suffocation, that he was obliged to stop suddenly. This indisposition terminated in a few hours in a violent cold shivering, followed by heat and perspiration.

After this the paroxyms of suffocation were frequently renewed.

Two months after the first appearance of this symptom, and three before his entrance into the hospital, the monthly discharge by the anus had ceased, the respiration had become more difficult, and a peculiar kind of hissing noise took place in breathing, which was daily more laborious. Finally, on the twenty-seventh of October, 1803, he came into the Clinical Ward; his lips were then livid and puffed, his face was pale and yellowish, his body emaciated, the mouth rather clammy, and the tongue whitish: the inspirations were difficult and whistling, particularly during the paroxysms: the chest, on percussion, sounded well on every part, except towards the upper portion of the sternum; the cough was frequent; the expectoration mucous and streaked with blood; he could only breathe in a sitting posture; the pulse was soft, tolerably frequent, and full on the left side, but almost imperceptible on the right. The belly was in a good state; the urine flowed in abundance, the stools were rare, the sleep was interrupted by startings, and the left thigh, leg, and arm, were œdematous.

Some of these symptoms were indicative of asthma, or some analogous affection. However, the countenance of the patient, part of the chest not sounding on percussion, the peculiar difficulty in breathing, the characters of the pulse, and the starting out of sleep, left no doubt as to the nature of the disease, and I announced the existence of an aneurism of the aorta.

Most of these symptoms existed at all hours of the day; however, they all had more intensity at particular periods, constituting true paroxysms which, without being perfectly regu-

lar, generally occurred between eight and nine o'clock in the morning.

During the time the patient was at the Hospital, the paroxysms were more or less frequent; he had two or three every day, and the same number by night; they lasted for one, two, or three quarters of an hour; motion generally brought them on; at other times, they came on after taking food; and those which occurred in the morning, and were the most regular, came on without any occasional cause. During these paroxysms, the difficulty of breathing was increased; the inspiration was noisy and sibilant; the pulse was smaller, and more irregular, but scarcely perceptible on the right side; while the body was convulsed, the face covered with sweat, and of a violet colour. When they were very intense, faintings took place, and the chest was painful for a long time after they had ceased. Their approach was announced by numbness, tingling in the ears, heat about the head, &c. During their continuance, violent and tumultuous beatings of the heart were sometimes felt; there were also frequent eructations and fugitive shiverings. At the height of some of the fits, the patient fell senseless, with his head on his knees; finally, during the latter paroxysms, the urine came away involuntarily.

This patient, during his stay in the Hospital, became weaker and weaker; the œdema was not considerable, and only remarkable on the right side; the appetite ceased; and, at length, he died in one of the paroxysms, on the 25th of November, at ten o'clock at night.

At the time of opening the body, the countenance was pale, and the body thin; percussion

of the chest produced but a dull sound, particularly on the left side.

The brain was in a good state.

The trachea being opened above the upper edge of the sternum, was found filled with a frothy liquid, and with very long and firm fibrinous laminæ. The lungs were sound, crepitous, and without adhesions. There was a little water in the left cavity of the chest.

The heart was rather larger than in a natural state. The aorta, at its origin from the left ventricle, was dilated, and formed an aneurism which might hold a substance larger than the first. The parietes of this bag, formed by the coats of the artery, were thickened; they were not ruptured, but merely rugose on their internal surface. This tumour, pressed upon the trachea above its division, and also on the bronchiæ, so that these pipes were much flattened; the surface, corresponding to the adhesion which the tumour had contracted with them, was rather red, without any well marked alteration in the texture of the internal membrane.

The vessels which originate in the arch of the aorta, had their usual caliber, but there was visible, rather forward in the aorta, a large callous spur, which might act as a valve, and prevent the column of blood in this vessel from being directed towards the right subclavian, and compel it to pass entirely into the carotid artery.

The radial artery of the right arm was bifurcated towards the inferior part of the radius, which, added to the small quantity of blood which passed through the subclavian, well explains the characters of the pulse on the right side.

All the other viscera were sound.

It is very difficult to explain, in cases of this nature, the paroxysms, and their periodical return, and how it happens that the tumour, constantly pressing on the trachea, does not bring on continual stiflings. Without doubt, the paroxysms were renewed when the tumour became gorged with blood; but to what cause can be attributed this periodical accumulation in the tumour?

These paroxysms are most frequently observed in cases of aneurism of the aorta; but I have also often seen them in diseases of the heart, particularly where there is a contraction in one of the apertures of that organ.*

Section IV.

OF THE PROGNOSTIC IN DISEASES OF THE HEART.

Whether diseases of the heart assume an acute or chronic character, the prognostic is always very unfavourable. However, this assertion admits of much modification.

In order clearly to establish the prognostic in these diseases, it is necessary to divide them into several kinds. 1st, acute; 2d, chronic organic; 3d, organic, properly so called.

* This case would have been more properly placed under the article of aneurisms of the aorta. Its periodical nature alone is important here, as completing the history of the course of diseases of the heart in general.

1st, *Acute* diseases of the heart, cannot with propriety be classed with the organic; those to which I apply the former epithet, are *pericarditis* and *carditis.*

With respect to the prognostic, these diseases are on a level with the other acute inflammations in general, the only difference consisting in the greater degree of danger which usually attends them. It varies according to the degree of inflammation.

When acute *pericarditis* does not announce itself, at its onset, by very violent symptoms; when the heart, lungs, &c. do not appear to participate, or but in a very slight degree, in the inflammation, and when the patient is healthy, and of a good constitution, the prognostic may be rather favourable: thus, now and then, though very rarely, *pericarditis* by the efforts of nature, assisted by art, has a happy termination.

These fortunate cases are not, however, very common; for it rarely happens that this inflammation is isolated from that of the costal, diaphragmatic, mediastinal, and pulmonary pleura, and even of some portion of the lungs themselves, and of the surface of the heart, which, in all cases, is more or less inflamed. The disease then, in these instances, either terminates in death, or in one of those affections which I call *chronic organic,* such as a purulent crust *(purulence)* on the pericardium, the adhesion of that membrane to the heart, its chronic inflammations, &c.

The prognostic in inflammation of all the tissues of the heart, or *carditis,* whether complicated with a similar affection of the other viscera of the chest or not, is, in all cases, highly un-

favourable, if not even mortal. In fact it rarely happens that parts which have the muscular fibre for their base become inflamed, without ultimately suppurating; now the suppuration of any of the viscera in the large cavities of the body, and particularly of this viscus, can rarely occur without causing death.

I much doubt whether complete resolution ever took place in acute *carditis;* and even if such cases should be reported, my doubts would not be entirely removed, as the true seat of the inflammation can only be unequivocally ascertained by examining the body after death.

This inflammation then must almost always terminate unfavourably; but the death which it occasions, may be rapid or slow. Thus, *carditis* has sometimes a fatal termination in a few days, while, at other times, when it has reached its height, the most alarming symptoms in part disappear, and a kind of convalescence takes place, now and then approaching to a state of apparent health. The patient, in this case, flatters himself with a speedy and perfect cure, while the clear sighted physician, only sees the transformation of the disease into *a chronic organic* one, which though less rapid, is not less fatal.

In the class of acute lesions of the heart, considered in respect to the prognostic, ought to be placed the partial ruptures of which I have already spoken, such as the rupture of one of the columnæ carneæ, or chordæ tendineæ.

The rupture of the fleshy pillars of the heart, seems to occasion all the symptoms of a highly acute affection, if we may judge from those observed in the Messenger, who forms the subject of case 40, page 234.

The prognostic, in all cases, where this lesion can be recognized, is desperate, and the physician should announce its fatal termination, which will occur most promptly when the injury has taken place suddenly in a healthy organ.

The rupture of the valvular tendons, is, according to my experience, less serious, and less speedily fatal, than that of any portion of the muscular substance of the heart. In fact, in almost all the instances which I have seen, the result has been an organic disease of the whole heart, and not an acute affection of that viscus. See case 41, page 237.

I shall say nothing here of the prognostic in complete ruptures or lacerations of one of the cavities of the heart; they can only be ascertained by their effect, which is sudden, or at least very speedy death.

2d. The diseases of the heart which I denominate *chronic organic*, are almost all of them the consequences of those acute inflammations, the prognostic of which I have been speaking of; among this number are serous or purulent effusions in the pericardium, adhesions of this membrane to the heart, ulcerations on the surface of that organ, its chronic inflammation, and the softening of its substance, &c.

Thus, when *pericarditis* or *carditis*, has reached a point at which the symptoms usually appear more moderate, the disease assumes different characters, but which are not less fatal because more mild. The prognostic, always unfavourable even from the beginning, is less so when the inflammation, having reached its height, suddenly diminishes, but becomes more so, when the concurrence of certain symptoms announces

a serous or purulent effusion in the pericardium, or that the disease has undergone some other unfavourable change. If the physician has not been previously aware of the alarming nature of the disease, which has left behind it the one of which he is seeking the prognostic, the researches necessary to ascertain the latter, will enlighten him with respect to the former.

3d. If, in treating of the prognostic of diseases of the heart, I had divided them into curable and incurable, I should have placed among the former, with acute inflammations, the greater part of *organic diseases* in their commencement, which would, doubtless, often yield to the efforts of medicine, if their primary symptoms were sufficiently evident to the patients themselves, to induce them to apply for medical relief at the very onset; for there are, as I have before said, physical and rational signs by which the experienced and attentive physician may reasonably suspect their formation.

But if these organic lesions are of long standing, if they have made evident progress, if all the functions connected with the circulation have felt the change in it, the prognostic is then completely hopeless, and the physician has no longer to estimate the danger of the disease; from the moment that he learns the certainty of its existence, he recognizes a mortal affection, and his experience can only enable him to calculate how long the patient may drag on a miserable life, and to select the means which may render it the least insupportable.

It is from the nature and intensity of the organic lesion, the constitution of the individual, his manner of living, &c. that the practitioner is

enabled to pronounce upon the fatal, and more or less speedy termination, of the disease.

If the organic disease attacked with violence, if it have from the beginning, assumed alarming symptoms, if the disturbance in the circulation announce an important lesion of the principal organ of that function, the prognostic will be much less favourable, than if the disease had commenced with greater mildness, or offered different or opposite characters.

With respect to the constitution of the individual, if it be vigorous and free from morbid humours, and if he himself be in the flower of his age, exempt from violent passions, and in submission to wise counsels, the termination may be presumed to be less speedily fatal, than under contrary circumstances.

Finally, in respect to the manner of life, if the patient be abandoned to vice and debauchery, if he be guilty of every excess, if by his situation he be exposed to the inclemency of the weather, if he be compelled to laborious and fatiguing exertions, if he be intractable and liable to acute moral affections, &c. he will proportionally shorten his life; while by sobriety, temperance and management, he may not only prolong his days, but even suspend for years, that organic disease to which he must ultimately fall a victim.

Section V.

OF THE TREATMENT OF DISEASES OF THE HEART IN GENERAL.

After what I have said on the nature and general prognostic of diseases of the heart, it is

clear that the treatment must be different according to the admitted curability or incurability of these affections, and that the same mode of treatment cannot be proper for each.

The means employed should be either *curative* or *palliative*, according to the nature or stage of the disease. Thus in a great number of organic lesions of the heart, as for example, in active aneurism, the indication is to diminish the general strength of the patient, and that of the heart in particular. On the contrary, in other affections, such as passive aneurism, the object is to increase the strength of the individual, and thus to communicate, indirectly, to the heart that energy which is wanting.

These considerations induce me to follow, in the history of the treatment of the diseases of the heart, a path analogous to that which I have taken in treating of the prognostic. I will then examine, successively, the different modes of treatment. 1st, For *acute* diseases of the heart; 2d, For those which I have denominated *chronic organic*, and which are generally the consequences of the acute; 3d, Finally, for *organic* affections, properly so called, with excess or defect of strength, suspected or acknowledged, complicated with some virus, according to the stages which they may have reached, &c. I shall conclude by some observations upon regimen, exercise, and the influence of some of the passions in these different diseases.

Having, at the close of each chapter, spoken of the treatment of the affections which formed the subject of such chapter, what I shall now say, will be merely a recapitulation of former remarks.

1st, The treatment of acute *pericarditis* and *carditis*, the only diseases of the heart non-organic and truly acute, consists in the employment of the same means that are used in inflammation of the other viscera of the chest. To develope the nature of the treatment proper in one of these phlegmasiæ, is to point out that which is useful in all, though some peculiar circumstances may render necessary a slight modification in those means, the efficacy of which has been best proved.

The antiphlogistic is the kind of treatment proper for acute *pericarditis* and *carditis*. General and local bleedings at the beginning, renewed if there be no sensible relief and if the pulse preserve its first characters; blisters on the painful part, applied less with a view of exciting an abundant suppuration, than of causing a powerful revulsion, aqueous, mucilaginous, and anti-spasmodic drinks, to allay the peculiar thirst in these affections, &c.; such are the means which experience has pointed out as the most efficacious in these diseases.

I have placed general bleedings at the head of the treatment recommended, because their utility, or rather necessity, has been admitted by all practitioners, and because they should always be employed before local, to diminish the irritation (*eréthisme.*) I think it right, however, to observe, that in all cases of inflammation of the viscera of the chest, I have known the local pain more completely and promptly relieved by local bleedings, even with leeches, than by general bleedings; and after using the latter I have occasionally employed the former with a more prompt effect, than the other had produced.

Blisters applied upon the painful parts, in *pericarditis* and *carditis*, have not, in general, so quick and salutary an effect, as in pleurisy, or pleuro-peripneumony; still in almost all cases a manifest benefit is obtained, though not always of long duration, particularly where the muscular substance of the heart is inflamed. Sometimes, indeed, notwithstanding the severe and continued use of these means, the disease passes by the usual period of its favourable crisis: the intensity of its symptoms, as I have before said, then diminishes, but it is only to assume a slow and chronic character, announcing a change of the disease, and its transformation into one of those, the treatment of which will form the subject of my second division.

The rupture of a fleshy pillar of the heart is an affection which I have constantly placed in the class of acute lesions of that organ. Its symptoms, its almost always rapid termination, and the mode of treatment justify this arrangement. The means proper in general inflammation, are those which will produce the most comfort; I speak here only of comfort; because, I much doubt if even an apparent cure be ever produced, experience having convinced me that this rupture assumes all the characters of an affection which must speedily have the most melancholy termination.

2d, Among the chronic organic diseases are, as I have before observed, slow inflammation of the heart, the effusion of pus or water in the pericardium, the adhesion of that membrane to the heart, &c.

The slow inflammation of the heart, has an obscure diagnostic; it is difficult to ascertain its existence, and to decide upon a proper mode

of treatment. It is rather a slow and almost imperceptible morbific action, producing an alteration in the substance of the organ, than a well-marked disease; it may, however, be recognized, by a fixed and obtuse pain in the region of the heart, which is more increased by muscular motion than by the act of respiration, by a slight but permanent hardness of the pulse, by the febrile diathesis, which takes place when the affection has existed for some time; and, finally, by the shiverings, horripilations and other signs which announce, in a more advanced period, that one of the morbid changes of which I have spoken, has occurred. If an inflammatory state evidently still exists, then the antiphlogistic treatment, pointed out in the preceding article, may, under certain modifications, with propriety be used; but if an actual change has taken place in the texture of the heart, then every thing leads to the belief that such treatment would be improper. In this case, the treatment should be directed to the increasing of the strength, the diminishing of the serous, cacochymic, or scorbutic diathesis, &c. according to circumstances, but which, of course, is insufficient and purely palliative.

When speaking of hydro-pericardium, I said, and I repeat it here, that the mode of treating it is the same as that of dropsy in general, and which I shall soon point out in detail; a treatment at best inefficient, and for which might be substituted the palliative or that for symptoms, without, however, obtaining more from it, than lengthening the duration of the disease, by retarding, for a longer or shorter period, the moment of death. I also said that tapping, in this

case, was an operation the inutility of which seems to be proved, as well by the little success usually obtained from paracentesis of the other serous cavities, as from the complications which render this peculiar dropsy more dangerous. I moreover added that, these considerations abstracted, the operation itself did not appear to me free from danger and uncertainty, as is incontestibly proved by that performed by the celebrated *Desault*.

The curative treatment of the adhesion of the pericardium to the heart, does not promise a more fortunate result. There are no known means of destroying those lymphatic or cellular, &c. adhesions, often intimate, and always of longer or shorter standing. Although medicine in these affections, as in many others of which I shall presently speak, cannot perform a cure, she can mitigate their intensity, by warding off symptoms which they might excite, and by teaching patients rules of management and regimen, which they cannot break without endangering or shortening their existence. The conclusion of this section will more fully explain these general ideas.

3d. To describe with precision the mode of treating organic diseases of the heart, they must be divided, as I have already done in the diagnostic of aneurisms, into different stages; without this division, which I use only for method's sake, it would be difficult to arrange a set of means, which might be employed in the radical or palliative cure of these affections.

The organic diseases of the heart, of the treatment of which I have still to speak, are principally active and passive aneurisms of that

organ, the contractions and ossifications of its different orifices, &c.

First Stage.—I examined in considerable detail (Class 2, Chap. 3, Sec. 4,) the means proposed for the radical cure of aneurisms in their first stage, abstracting those complications which often place an insurmountable obstacle to their cure. After having passed in review some causes of diseases of the heart, which I considered as beyond, and others within, the reach of art, I discussed the advantages and disadvantages of the various curative methods proposed by different authors; I particularly described the debilitating plan called the *method of Valsalva*, and pointed out those cases in which it might possibly be employed with benefit. On this subject I will add, that many reputable authors have employed it with manifest advantage and even success; but however efficacious it may be, the state of excessive debility into which it is necessary to reduce the patient, who, perhaps, is in apparent good health, naturally excites much reserve in using it. Although I have seen many cases in which it might have been adopted, I have always dreaded to employ it, lest I should hasten the death of an individual, attacked it is true with a mortal disease, which would drag him, nevertheless, but slowly to the tomb.

The consideration of this mode of treatment naturally leads me to speak of the derivative method recommended by *Morgagni*.

I endeavoured to appreciate the value of these different methods, the isolated, combined, or modified employment of which constitutes the

treatment of the greater number of diseases of the heart, in their first stage. I mentioned, in another article, what might be expected from an anti-syphilitic treatment, where the history of the patient led to the suspicion that the disease of the heart might have a venereal origin. I might have supported my opinion on this point, by the authority of *Morgagni, Lancisi, Matani,* and many others; I passed lightly over the use of issues in these affections, conceiving that they can only be useful where an habitual discharge, a psoraic, herpetic, or some other humour has been suppressed, and the suppression of which was coincident to the first symptoms of a disease of the heart or large vessels. The inoculation of the suppressed itch, would produce better effects. Violent palpitations, brought on by the suppression of numerous psoraic pustules, have been dissipated by restoring the itch to the person in whom it had been destroyed.

Vesicatories, rubefacients, and sinapisms, may also be exceedingly useful in a disease of the heart, which may have suddenly taken place in an individual subject to acquired or hereditary gout or rheumatism; in this case, they should be applied to the arms, to the chest, and what is still better, if it be known, to the former seat of those affections. The good effects which are daily derived from these means in the metastasis of a gouty or rheumatic humour upon the viscera, do not admit a doubt, that the same favourable results would occur in diseases of the heart, arising from the same cause; indeed this has been confirmed by practice.

I thought it right to defer, to this section, the palliative means to be employed in these

affections, when they had reached their second and third stages, as they are equally proper for the same stages in all diseases of the heart. This palliative treatment then, will form the subject of the remainder of this article, following it successively in the second and third stages of affections of that organ.

Second Stage.—The second stage of diseases of the heart, is that in which patients generally come to hospitals, and it is that in which the disease has already struck deep root. Medicine can then only attempt to arrest, or rather retard, the further progress of the affection, allay the symptoms which attend it, and remedy, as far as possible, the derangements which it has excited.

It is in this stage, that the habitual suffused state of the countenance, the numbness, the palpitations and a sort of periodical plethora, render necessary frequent bleedings, either with a cutting instrument or by the application of leeches to the anus, which, in these cases, have generally a more salutary and prompt effect. The relief which patients thus obtain, leads them to wish for a frequent repetition of these bleedings, which nevertheless must always be employed with discretion: for it is in this case as with tapping in ascites, when it is the consequence of a disease of the liver or any other organ; to the momentary advantage derived from it, succeeds a still more alarming state, a still greater effusion. Thus, too frequent bleedings in the second stages of diseases of the heart, produce debility, and bring on or increase the serous diathesis, to which, in these affections, there is usually but too great a tendency.

Morgagni's method, or the frequent immersion of the arms and feet in hot water, in fact, whatever can operate by revulsion, by soliciting blood into the extremities from the heart and great vessels, is exceedingly proper, because this may be employed where frequent bleedings would be improper; but I repeat that these means can afford but transient relief.

The constriction of the throat, slight vomitings, paroxysms of convulsive coughing, in short, a peculiar state of general irritation, symptoms frequently observed in the second stage, may be combated with success by antispasmodics and anodynes.

Already is the urine scanty, and the belly swollen; the lower extremities are œdematous; but still these symptoms will, for the present, readily yield to diuretics, nitrous aqueous drinks, and hydromel of squills.

In general, this second stage is marked by continual alternations of disease and apparent health. Patients come to Hospitals with a suffused and violet face, pain in the head, difficulty of respiration, strong, diffused, and irregular beatings of the heart, &c. according to the nature of the lesion; but by the well directed use of the means before recommended, or of analogous ones, pointed out by peculiar circumstances, as hydragogue purgatives for example, where derangement of the stomach is added to the other symptoms, or where constipation aggravates them, they are often restored to a state of health which they are always disposed to take for a perfect cure, but which is immediately disturbed by the slightest fatigue or irregularity in diet, in a word, by the most trifling causes.

THIRD STAGE.—Among the great number of symptoms of organic diseases of the heart, which have reached the third stage, there are only a few for which even the palliative treatment can be employed. The subapoplectic disposition, the frequent palpitations, the violent beatings of the heart, the continued or periodical stiflings, the dropsy of the cavities, and the general leucophlegmasia, are the principal symptoms to be mitigated. At this period, the means which have hitherto been eminently useful, are too frequently inefficient or useless.

The means calculated to assuage or dispel the above symptoms, may collectively be placed in two principal classes; the first will be equally proper for the subapoplectic state, the palpitations and beatings of the heart and the stiflings; the second, for the general and particular dropsies, consecutive to diseases of that organ.

The former symptoms which seem to arise less from general plethora than from a gorged sanguineous state of the cerebral or pulmonary vessels, or from that of the cavities of the heart itself, will be best opposed by a cautious use of those means which I have found most useful in the second stage, such as occasional but slight bleedings, either general or local, in the arms, at the anus, or in the neck, by leeches, when the subaploplectic state is threatening, and on the chest, when generally painful, as I have sometimes observed it.

Under the same circumstances, and with the same views, pediluvium, and the immersion of the arms in hot water, may be resorted to; it is when the paroxysms are frequent that this method is most useful, particularly if aided by an-

tispasmodics and anodynes, employed to prevent their return, or moderate them when they exist. It rarely happens in this stage, that the serous diathesis is not added to the symptoms before enumerated; in most cases, it is even at its height; not only are the limbs distended and deformed by water, but the principal cavities are also loaded with it.

Those medicines which operated with some effect in the second, generally fail in this stage; it is, therefore, necessary to have recourse to such as are still more powerful, though these seldom give much satisfaction. However, bitter, tonic, and nitrous drinks, may often be employed with transient benefit; such as *compound* and *nitrous hydromel*, prepared according to the formula of the Hospital of "la Charité," into the composition of which enter elecampane root, the tops of hyssop and ground-ivy, and honey; the *preparations of squills*, as the *oxymel* and *wine*. I have used in many cases, with manifest advantage, bitter and diuretic wine, of the formula of the same Hospital, composed of Peruvian and Winter's bark, lemon peel, angelica root, dried squills, wormwood, balm, and juniper berries, all infused in wine. This medicine restores the secretion of urine, and proportionally diminishes the serous diathesis and its consequences. I have often also used the *compound boluses of soap*; composed of white soap, jalap, aloes, and syrup of buckthorn; and likewise *Bacher's tonic pills*, made of extract of myrrh and black hellebore, and powder of carduus benedictus; and frequently also, syrup of buckthorn, and hydragogue remedies in general, according to the varied indications of the disease.

By administering these remedies, differently combined and modified, I have often succeeded in removing, in a short time, the œdema of the extremities, and even in diminishing the effusion in the thoracic or abdominal cavities, by increasing the secretion of urine, and causing the stools to be more copious, frequent, and watery. I have sometimes aided these means, by slight scarifications in the thighs or legs, when there were no spontaneous cracks; but I have done this with the greatest reserve, because these little wounds sometimes become gangrenous, and retain that character till death, in spite of the most proper dressings.

But the amendment procured by these means, is, in most cases, of short duration, and can deceive only the patients themselves, who, thinking that they are quite restored to health, resume, whether good or bad, their usual habits and occupations. But after a time, frequently a very short interval, the same symptoms return, and the patient becomes worse; two, three, or four times, the same remedies procure the same relief, to which succeeds a relapse still more unfavourable than the preceding; after a number of which, proportionate to the strength of the constitution, &c. death puts an end to a set of symptoms, against which medicine has no longer any resource.

The regimen should be severe in all diseases of the heart; light food, and that in small quantities, is alone proper; all strong liquors, &c. should be avoided. The frequent relapses in the advanced stages of these affections, are almost all brought on by errors in diet; It is true, that time alone, as the disease is not

cured, would generally produce them, but it rarely follows its natural course; its progress is, in almost all cases, hastened by excess in diet, by exercise, or by moral affections: while, by following a well regulated regimen, avoiding all violent or fatiguing exertions, and by tranquillity of mind, persons attacked by organic lesions of the heart, might occasionally pass the term, at which they almost always sink under them. Can, however, a few months or years at most, spent under all sorts of privations, constitute a supportable state of life; or is it worth while to purchase, at so dear a rate, a short period, to be passed in bitter agony, and the continual expectation of death?

Section VI.

OF THE SIGNS BY WHICH ORGANIC LESIONS OF THE HEART MAY BE DISTINGUISHED FROM CERTAIN COMPLAINTS OF THE CHEST.

FIRST.

Means of Distinguishing Acute Affections of the Heart, from Acute Inflammations of the Chest.

Acute inflammations of the pericardium or of the heart itself, much resemble, in their symptoms, pleurisy and peripneumony, with which, moreover, they are very often complicated; there are, however, signs by which to distinguish their existence, either in a state of isolation, or in their different degrees of complication.

In the first Section of the first Class, I sufficiently dilated on these distinctive signs to render it unnecessary again to recur to them here. I also (page 236) drew a parallel between the signs of a sudden rupture of one or more of the carneæ columnæ, and those of peripneumony and carditis. I therefore refer the reader to those articles, and will content myself here with pointing out the signs by which hydrothorax, asthmas, and such like affections, may be distinguished from organic diseases of the heart, with which they have often been confounded.

SECOND.

Means of distinguishing Organic Lesions of the Heart from the different kinds of Asthma.

The compression of the lungs by a tumour or aneurismal dilatation, or even the sanguineous gorged state of that organ, are, in diseases of the heart and great vessels, the chief causes of the difficulty of breathing and breathlessness which constantly accompany them. This peculiar difficulty of breathing is one of the first symptoms which strikes an observer on seeing a person affected with a disease of the heart. An inexperienced physician, or one who contents himself with a superficial examination in forming his diagnostic, or who is pre-possessed with the idea of such and such a disease, on the mere view of this principal symptom, hesitates not to say, that the patient is afflicted with a dry or humid asthma, or with some other chronic affection of the chest under the names of dyspnœa, orthop-

nœa, &c. He commits this mistake the more readily, because, persuaded of the justness of the first opinion, he neglects those ulterior researches which would convince him of his error, and point out the true nature of the disease.

It is in the constitution of the individual, in his physiognomy, in the history of the symptoms which accompany the attack and developement of the disease, in the examination of the phenomena of the pulse, in the absence of cough, and in the results of percussion of the chest, that the physician, who wishes to form a correct opinion, will find those particular signs which will enable him to decide with precision on the nature of the affection.

From the history of the developement of the disease may be gathered, which of the two organs (the heart or lungs) was primarily affected. Thus, if it were the heart, it will have begun by irregular beatings, palpitations, and oppression of that organ, &c.

On the contrary, in cases of asthma, the lungs will be first affected (without the circulation appearing sensibly disturbed) by a difficulty of breathing, which sometimes comes on slowly, at other times rapidly, and which gradually increases during the paroxysm until it is almost suffocating.

In asthma, the chest, on percussion, far from announcing, by the absence of sound, the enlargement of any organ or the presence of any extraneous body, either solid or fluid, sometimes sounds better than in a natural state, whereas in almost all affections of the heart, the region of the chest, usually occupied by that viscus, or even

that where the great vessels rise from it, sounds very indifferently, and often not at all.

It is by attentively observing the phenomena of the pulse, that we shall discover the surest mode of distinguishing these diseases; for how can we confound its regularity and quickness, during a paroxysm of asthma, with its too great strength or weakness, its hardness, vibration, irregularity, inequality, imperceptibility, and its many other varieties, in cases of lesions of the central organ of the circulation, even when the paroxysms, so called, do not exist?

Can the regularity of the paroxysms of asthma, be considered as one of the characters calculated to enable us to distinguish between it and a disease of the heart? In many cases it cannot, because affections of the heart or large vessels have also, sometimes, well-marked and regular paroxysms, as is proved in the Section devoted to the history of the developement, course, and termination of organic diseases of that organ.

It follows then, from what has been said, that the dyspnœa, observed in diseases of the heart, must not be confounded with the different kinds of asthma, which arise from an alteration of the texture, properties or nerves of the pulmonary organ; that although these two diseases, one of which is symptomatic, secondary and consecutive, have often been confounded, there are, nevertheless, certain and ready means of distinguishing them; that these distinctive signs are principally furnished by the history of the developement and course of the disease, by percussion of the chest, and by a comparison of the different phenomena of the pulse in these

various affections. I do not absolutely exclude the possible complication of these two diseases. I even think that chronic dyspnœas, or by whatever other name they may be called, are a frequent cause of organic diseases of the heart or large vessels, which may be always ascertained from a history of the patient.

THIRD.

Means by which Organic Lesions of the Heart may be distinguished from Dropsy of the Chest.

For want of a precise knowledge of the signs of organic diseases of the heart, they have frequently been confounded with dropsy of the chest, the recorded symptoms of which were but little more correct. This error is observable in many works, in which cases of hydro-thorax are cited, but which are, in truth, histories of organic diseases of the heart, recognizable by the union of symptoms proper to those affections; while the hydro-thorax, which was considered as the idiopathic disease, was purely consecutive.

If the signs of the commencement, course and termination of a well proved case of dropsy of the chest, be compared with those of similar stages in diseases of the heart, so wide a difference will be found between them, that the diagnostic cannot be easily mistaken; but let me draw the parallel.

In idiopathic, confirmed, and *non-complicated*, hydro-thorax, the countenance is pale,

wan, thin, and unbloated; the eyes are dull and languid; the lips pale and thinned.—In all diseases of the heart, the countenance is red, violet, bloated, and often even anasarcous; the eyes are red, bright, watery; the lips swollen, violet, blackish.

In hydro-thorax, the chest, on the effused side, is usually more protuberant, and rounded; and towards the close of the disease, the intercostal spaces are constantly widened by the separation (*ecartement*) of the ribs; there is also œdema on that side.—Nothing of this kind takes place in diseases of the heart and great vessels; it is true, that sometimes a large aneurismal tumour lifts up and projects the parietes of the chest; but the swelling, in this case, is circumscribed, and does not, as in the former, extend to the whole side of the chest. Moreover, the pulsations, in this region, render it impossible to confound these two diseases.

In hydro-thorax, the integuments of the affected side of the chest are, particularly towards the close of the disease, anasarcous; and this anasarca united, in a small number of instances, to that of the arm of the same side, is isolated from that of the lower extremities, or from any general serous diathesis. In affections of the heart, the parietes of the chest become œdematous, only when the disease, from its long standing, has brought on a general leucophlegmasia.

In hydro-thorax, percussion of the chest, performed while the patient is sitting or standing, always produces a noise similar to that excited by striking the thigh with the palm of the hand; this defect of sound is only perceptible on the side diseased, and when the cavity is only in part

full, not higher than the level of the water.—In diseases of the heart, percussion produces quite different results. The chest does not sound in the forepart of the region of that organ for a greater or less extent, while, in all other parts, even on the left and behind, the sound is usually natural; because, in those parts, the lungs are not altered, except in few cases, or unless the serous diathesis has produced some effusion in the cavity.

In hydro-thorax, patients always lie horizontally, some on the diseased, others on the opposite, side, and the greater number on the back.—In diseases of the heart, patients never lie quite straight, but with the chest and head so raised up as to be nearly sitting, at other times completely so, and often leaning forward; it is unusual to see them, even when sitting, incline to either side, except when they are about to expire.

In hydro-thorax, the patient enjoys, until he dies, all his senses and intellectual faculties.—In diseases of the heart, particularly towards the end, patients have often fits of absence, and even slight delirium; sometimes they are in a sub-apoplectic state, and die in extreme agony.

In hydro-thorax, soft, feeble, and regular pulsations may be felt in the region of the heart, sometimes slow, or only slightly frequent, but never palpitations.—In diseases of the heart, the pulsations are hard, vibrating, diffused, frequent, irregular, intermittent, noisy, and variable, as the lesions themselves; there are always also more or less strong or frequent palpitations, particularly when the disease has made some progress.

In hydro-thorax, the pulse is generally full, rather soft, slow, tranquil and regular; weaker and more frequent, according to the stage of the disease, but always remarkable for its regularity. —In diseases of the heart, it offers very different characters; it is hard, full, vibrating, frequent, irregular, very intermittent and variable, undulating, almost imperceptible, &c.

In hydro-thorax, the breathing, although short and affected, is tolerably easy; the cough trifling, dry, or with little expectoration; patients do not awake from their sleep with startings. The urine is almost always in a natural quantity.—In diseases of the heart the breathing is always difficult, interrupted, and much agitated, particularly in the advanced stages; the cough is often violent, obstinate, and very harrassing; the expectoration abundant, mucous, viscid, sometimes bloody, or even blood itself; and the sleep continually interrupted by startings. The urine is frequently almost suppressed, and its secretion always irregular; it is turbid, sedimentitious, and bricky.

In hydro-thorax, the disease moves on slowly, but regularly, without frequent or well marked alternations of better and worse; the symptoms are always the same; and the patient reaches his end quietly and gradually, without agitation, anxiety, or much agony.—In diseases of the heart, the patient is sometimes better, sometimes worse; sometimes, too, there are very long intermissions in the symptoms, or rather in their intensity; the progress of the complaint is irregular, except towards its close; death takes place, after an alarming and painful agony, hardly ever tran-

quilly, sometimes suddenly ; at other times, the patient is in a subapoplectic state, often in one of horrible anxiety.

In cases of hydro-thorax, we find after death, externally, the face emaciated and pale, the chest rounded, and the integuments anasarcous on the affected side, the abdomen free from effusion, and the limbs very thin: internally, a considerable quantity of water is effused in one or other of the cavities of the chest, sometimes it is completely full; the lungs are shrunk in proportion to the quantity of water, little or not at all crepitous, pale and as if macerated; the heart is rather diminished than increased, empty, and free from internal disease; there is, very rarely, effusion in the abdomen.—In diseases of the heart, the face, after death, is large, swollen, violet, œdematous; the veins of the neck often projecting: the parietes of the abdomen are distended by the fluid in that cavity, and all the integuments swollen with water, particularly those of the upper and lower extremities; the quantity of water in the chest, is usually very trifling, and when there is any remarkable consecutive hydro-thorax, there are always effusion in the abdomen, and general leucophlegmasia; the lungs are violet and gorged with blood; and the heart always presents indubitable marks of some lesion.

Were I now to compare the collection of symptoms just pointed out as belonging to uncomplicated hydro-thorax, with those given by many able writers, *Cullen* among the rest, it would be easy for me to prove that he, as well as they, have been deceived in many cases.

In fact, those dropsies of the chest, in which many of the symptoms shall be found which he ascribes to that disease, I venture to affirm, are true organic affections of the heart, complicated, in some cases and in their latter stages, with consecutive hydro-thorax, but which is hardly ever isolated, as before observed, from dropsy of the other cavities and general leucophlegmasia.

Most of the characters attributed by that author to dropsy of the chest, are either insignificant or erroneous. I term insignificant, when they are isolated, dyspnœa and paleness of the countenance, which are also found in many other diseases of the chest, and œdema of the extremities, which, moreover, is very uncommon in hydro-thorax. I regard as erroneous, startings from sleep, palpitations, the irregularity and intermission of the pulse, even in an advanced stage, and the patient's lying from necessity on the affected side, a symptom which is not constant, except, perhaps, towards the close of the complaint.

Cullen admits that he never used percussion of the chest, in forming his diagnostic of hydro-thorax; by this omission, he deprived himself of the means which would have enabled him to rectify his observations on this part of practical medicine.

The distinction which I have made between idiopathic hydro-thorax and that which is consecutive, most frequently, on diseases of the heart, appears to me important, because, in the former, those remedies which are used in dropsy, and particularly in hydro-thorax, may be employed with some chance of success; and even, in some cases, tapping may be ventured on; but

there is little hope of curing the latter, because it is first necessary to attack the organic lesion, which is generally incurable.

These two kinds of dropsy of the chest differ likewise in their causes.

Those of idopathic hydro-thorax, are often obscure; nevertheless observation has pointed out some which appear to operate in most cases, such as suppressed perspiration, repelled humours, taking iced drinks when in a state of perspiration, repeated venesections, and above all, the inflammation of parts in the neighbourhood of the pleura; finally, every thing which may destroy the equilibrium which ought to exist between the exhalants and absorbents of that membrane.

In consecutive hydro-thorax, the efficient cause is the same; it is always, probably, the defect in the equilibrium, in the action of the exhalants and absorbents; this is, perhaps, produced by the influence of the lesions of the heart upon the neighbouring parts, or, still more probably, by the subversion of the laws of the general circulation, of those of the capillaries, and, finally, of the exhalants; by the degenerated and serous state of the blood, which always precedes the derangement in the action of the exhalants, &c.

But in what manner have the organic lesions of the heart so powerful an influence in producing the general serous diathesis, or that of hydro-thorax in particular? Is it because the blood not flowing freely through the large and even the capillary vessels, loads and distends them; that their pores being then more open, the serum of the blood filters out and collects in larger quantity? Might not this phenomenon, for the most

part, arise rather from a sort of decomposition of the blood, necessarily resulting from the subversion of the circulation and respiration, and of the harmony between these two functions, perhaps from them all united. Notwithstanding the progress made in physiological science, these facts cannot be satisfactorily accounted for.

If the difference in the causes of idiopathic and symptomatic hydro-thorax, furnish the means of distinguishing these affections, still more decided means are to be found among the signs of diseases of the heart, signs which exist in all cases of hydro-thorax consecutive upon these diseases. The complete parallel, above drawn, between these two affections, appears to me to prove it to a demonstration.

After all that has been said in this Section, it may be affirmed, that idiopathic hydro-thorax is only to be distinguished by negative signs, that is, by the absence of all those which are peculiar to diseases of the heart; for if one or more of these signs exist, it may be safely concluded that the hydro-thorax is consecutive.

FOURTH.

Means by which Palpitations, symptomatic of Diseases of the Heart, may be distinguished from other Palpitations.

In most of the diseases of the heart of which I have treated, palpitations will be found recurring with more or less violence. Many authors have considered palpitations as idiopa-

thic diseases, which they have divided into distinct species, according to their nature or cause. Others, without considering them as perfectly idiopathic, have laboured to find out their cause, and have sometimes attributed it to the thickness or acrimony of the blood, at other times to the excess or bad quality of the bile. Some have referred them to the bad state of the stomach and other viscera of the abdomen; others have considered them as generally nervous, &c. each author entertaining a different opinion on this subject.

I am far from denying the sympathetic influence of one organ upon another, and consequently that of the viscera of the thorax or abdomen upon the heart in particular. But, the theory of sympathies, always very obscure, notwithstanding the researches of the moderns, has, I think, been too frequently put under contribution, to furnish us with explanations, which our want of a precise knowledge of the diseases of the heart prevented us from seeking or finding in those very diseases.

I might, with justice, be accused of exaggeration, if, in attributing almost all palpitations to diseases of the heart, I did not here establish a distinction between slight, feeble and fugitive palpitations, the cause of which, usually a moral one, is known, and those which are strong, violent, frequent, and almost continual for months, and even for years, the causes of which are often obscure, and almost all of long standing, and which are, I repeat, signs of diseases of the heart.

To look upon palpitations in general, and in all cases, as signs of existing or future diseases of

the heart, would be to commit an error, into which an attentive or judicious practitioner cannot possibly fall; an error, the more to be deprecated, because it would produce misery in the minds of a crowd of persons, momentarily affected by them, but without any serious character. These circumstances prove, that it is highly important to point out, in the best possible manner, the precise characters by which these two species of palpitations may be distinguished, more particularly, as the practitioner who confounds them will make no difference in their treatment.

The causes of palpitations may, in many cases, establish between them tolerably distinct and conclusive signs. In fact, moral affections, violent exercise, momentary impediments to the circulation, produce palpitations in some persons, which vanish almost as quickly as the cause; while the same causes, in others, produce palpitations, which, by their violence and duration, soon prove, that the organization of the heart has been altered by the cause which gave rise to them.

Among the causes of palpitations there are some which, in all cases, appear to act so powerfully and to produce such decided effects, as to excite greater apprehension for their consequences. Such, for example, are those produced by the metastasis of some humour upon the heart, by extremely acute and prolonged moral affections, by the continued suppression of some habitual sanguineous evacuation, &c. It may be advanced, as a general position, that the danger connected with palpitations is always

proportionate to the vivacity, violence and duration of the causes which excited them.

It is then in the nature of the palpitations themselves, that may be found the signs most proper to mark the distinctions, which I have said ought to be established; but how many shades and varieties do they exhibit, from the violent, noisy, irregular and convulsive palpitations of the heart affected with active aneurism, to the feeble flutterings excited by an agreeable moral affection, to the tremblings of the heart, void of blood, after abundant or continued hemorrhage! It is scarcely possible, with a becoming attention to what has been said, not to distinguish between the two kinds of palpitations, which I have been describing.

I should wander from my subject were I to enter into the treatment of those palpitations, which arise from trifling causes, which have no serious characters, and which are purely spasmodic, and without organic lesion; but I refer the reader to the many authors who have written upon them, still advising him to be cautious in the use of the numerous remedies which have been prescribed for them, as bleedings, antispasmodics, tonics, preparations of iron, stomachics, purgatives, &c. means recommended by different physicians, according to their view of the cause of the palpitations, and which may all be useful under proper indications.

FIFTH.

Means of distinguishing the Sanguineous Congestion of the Liver, consecutive to diseases of the Heart, from other affections of that Organ.

In consequence of the disturbance in the circulation, and particularly of the difficulty which the vena cava inferior experiences in emptying itself into the right auricle, the liver, in diseases of the heart, undergoes peculiar changes, which, where the general serous diathesis prevails, may sometimes deceive.

In fact, in almost all these diseases, the liver becomes gorged with blood, as I have often proved on the dead subject, and assumes, particularly towards their close, a much larger size than natural. It may then be easily felt through the abdominal parietes; it is, sometimes, so considerable that its sharp edge extends much beyond the termination of the parietes of the chest, while its convex part pushing up the diaphragm and rising into the right cavity of the chest, prevents the lower region of that cavity from sounding on percussion.

A physician called in to a patient affected with an organic lesion of the heart, which has already caused effusion in the abdominal cavity, may, if he do not acquaint himself with the history of the attack and course of the disease, take this consecutive gorged state of the liver, for an original affection of that organ, and the dropsy as the consequence of it; I have known such errors committed.

This mistake, it is true, would not lead to much mischief in cases of indolent congestion, such as I have been speaking of; but when, as has often been observed, this gorged state is accompanied by pain, sometimes even acute, in the region of the liver, and which may be increased by pressing on the part, it may be taken for an acute or chronic inflammation of that organ, and be treated, in vain, by repeated bleedings, general and local, and other antiphlogistic means. Such a mistake may be injurious to the patient, inasmuch as a rigorous and protracted antiphlogistic treatment must greatly exhaust him, and at this advanced stage of the disease, may hasten his death; a few leeches alone would be sufficient to produce the transient relief that can be obtained.

This error may always be avoided. 1st, By not too hastily assuming the idea, in such cases, of a dropsy occasioned by obstructions, or accompanied by an inflammatory state of the liver, or any other analogous affection. 2d, By carefully ascertaining the known causes, mode of attack, and course of the disease. 3d, By examining and considering with attention, in all cases of dropsy, whether general or particular, the phenomena of the circulation, either in the pulsations of the heart or in the characters of the pulse.

Section VII.

STATE OF THE DEAD BODY IN PERSONS WHO HAVE DIED OF DISEASES OF THE HEART.

When death, a too frequent termination of diseases of the heart, has taken place, some of

the signs which characterize these affections during their progress, are still to be found on the dead subject. Thus, in a given number of bodies of individuals dead from a variety of diseases, a well-informed and experienced physician might almost, from the internal inspection of the body alone, point out that of any one, who may have died of an affection of the heart. To complete our knowledge of every thing relating to these affections, it may then be well to indicate the peculiar appearances of the bodies of those persons who have sunk under them. I will first consider the external state of the dead subject, and then give a succinct detail of the usual internal appearances.

FIRST.

External state of the dead Subject.

The countenance usually bloated and suffused, preserves nearly the same colour as during the disease; it is red, violet, streaked with black, livid; in other instances, it is paler, and it is only on the lips, the nostrils, the eye-lids, the lobes and lower edges of the ears, that this violet and marbled colour is perceptible; the lips appear swollen, inverted, much thicker than in a natural state, and more or less violet.

On the neck, deep violet streaks are often perceptible, and the external jugular veins are so projected and loaded with blood, that I have often, in puncturing them, seen it spring out with a force and continuance very unusual in the section of this vein during life, and have even caught several pallets full of it. Might not this pheno-

menon sometimes deceive, and lead to a momentary suspicion, that a real was only an apparent death? In the days of ignorance and superstition the anatomist who had followed up a dissection after such a circumstance, might have been prosecuted; the fate of *Vesalius* is well known.

The external examination of the chest sometimes exhibits a well marked tumour, in cases of aneurism of the aorta. On striking the parietes of this cavity, similar results occur as when the subject was living, the chief of which is the absence of sound, to a greater or less extent, in the region of the heart, according to its size, &c.

The parietes of the abdomen are usually lifted up, and present all the signs of a dropsy of that cavity. However, some individuals sink under diseases of the heart without effusion taking place, because the progress of the disease has been too rapid to allow the serous diathesis to be established, and the formation of particular dropsies.

The upper and lower extremities are also generally swollen and œdematous; but this occurs less frequently in the arms than the legs, which also occasionally crack, a circumstance which never takes place in the former.

SECOND.

Internal State of the dead Subject.

Cavity of the Cranium.—The organs contained in the cranium do not, at the close of diseases of the heart, offer any characters which can

be considered as peculiar to those affections, since the small quantity of serum which is sometimes found between the meninges, in the ventricles of the brain, and towards the base of the cranium, and a certain degree of softness in the cerebral substance, are phenomena also observable at the end of other acute and of most chronic diseases, where the serous diathesis has actually formed.

Ought I to lay more stress upon a considerable quantity of blood, generally fluid, which is often furnished by the overflowing of the different sinuses of the dura mater? Although this accumulation is the effect of the obstruction of the current of the blood, caused by the disease of the heart, sometimes even producing a subapoplectic state, but very rarely complete apoplexy; still it cannot be exclusively attributed to these affections, as it is found, primitively or consecutively, in many others.

Cavity of the Chest.—As the thoracic cavity contains the organ, essentially and primarily affected, an examination of it throws much light upon the researches of the physician; he, in fact, discovers changes of all kinds in the pericardium, the organization of the heart and large vessels; here, serous or purulent effusions, increased thickness, erosion, &c. of surfaces; there, active or passive aneurisms of the heart; now and then, contractions of orifices, valvular indurations and excrescences; in short, a crowd of various affections, which are described in detail in the course of this work.

To avoid repetitions, I will dilate no farther on the indurated and gorged sanguineous state of the lungs, or on their being occasionally

anasarcous and macerated, or the kind of flattening of these organs and of the trachea, in cases of tumours, aneurismal dilatations, and serous effusions in the cavities of the pleura.

To have rendered these researches more complete, a more careful examination of the state of the lungs should have been attempted by various injections; particularly a minute dissection should have been made of the cardiac nerves, and been repeated in the different organic affections of the heart. Perhaps, some kind of alteration might have been discovered in those nerves, in their mutual connexion, or in that with the heart or pulmonary plexus, &c. which might have thrown a little light on the proximate cause of some of these diseases. I much regret that I did not attend to this point at a time when it was in my power so to do.

Abdominal Cavity.—I think I need not again recur to the frequent serous effusion in the abdomen, to the kind of maceration which the intestines sometimes undergo, and their blackish colour, which may arise from it, &c. However the injected and gorged state of the capillary vessels of the intestines, arising from a similar state of the liver, vena cava, venæ mesentericæ, &c. may, as well as the maceration, be the cause of their dark colour. My cases and remarks under the head of *blue disease*, go to this point, and confirm the more or less gorged state of the general venous system, and of that of the liver in particular, at the close of many of the diseases of the heart, and, above all, of those of the right cavities of that organ.

I shall here merely make a few remarks on two principal phenomena which appear to deserve

particular attention. 1st, A coagulated substance of a reddish brown is sometimes, though rarely, found in the stomach and the rest of the alimentary canal, which appears to be nothing but altered blood. 2d, The gorged state of the liver, which usually enlarges this viscus, partly causing the blackish colour of the intestines before-mentioned, and sometimes giving such sensibility to this organ, that pain is produced by the slightest pressure on it. Hence arose the error which some physicians have fallen into, of supposing the liver to be diseased, through ignorance of the diagnostic; in this way accounting for the dropsy, the difficulty of breathing by the dragging of the diaphragm, &c.; an error already noticed in Sections 5 and 6 of these Corollaries.

1st. I have found in several persons who died in consequence of diseases of the heart, the stomach nearly filled with sanguineous clots of a deep red colour, which were also found throughout the extent of the small intestines. I have also often seen, in cases of schirri of the stomach, a thick fluid in that cavity, very much resembling the above; but considerable difference was perceptible on examining it with attention. It was not, in fact, coagulated, as in the former case, but rather resembled a blackish fluid, in which was suspended a large quantity of fuliginous flakes, or of the colour of burned coffee.

If in cases of ulcerated schirri of the stomach, this matter were ascertained to be purely sanguineous, it might be supposed to be furnished by the vessels of the ulcerated schirrous surface; but when this kind of sanguineous substance is found after diseases of the heart, the mode of its formation is not so easily explained.

I know that the *vasa brevia* have been supposed to furnish sanguineous collections of this nature, by the communication which they establish between the spleen and the great cul-de-sac of the stomach; but I cannot conceive how it is possible for so much blood to be poured out into the healthy stomach, through vascular pores *(porosités)*. Never have I been enabled, in these cases, even with the most careful examination, to discover the orifices through which this effusion took place. Is it not more reasonable to suppose, that the liver, which, in affections of the heart, is always in a gorged state, should by means of the direct communication between the hepatic arteries and veins and the pori biliarii, unload itself, when the accumulation of blood is very great, into the hepatic duct, which finally sends this fluid into the beginning of the duodenum, from whence it may in part flow back into the stomach? I throw out this hint, however, at random, and for what it may be worth.

Whatever opinion, however, may be adopted on this subject, these facts and remarks are perhaps calculated to throw some light on the black disease of the antients, in which also I have never been enabled to find any trace of communication from the vasa brevia into the stomach, &c.

2d. The sanguineous congestion of the liver is the second phenomenon for my consideration. It exists, but not in an equal degree, in almost all diseases of the heart. Sometimes it is so great that a slight incision in the liver causes a quantity of black, and usually very thick, blood to flow. The size of the organ is, in general, sensibly increased by it. This state may be perceived even during life, when the patient

sometimes feels a slight pain, but which may be made very acute by incautious pressure.

This gorged state of the liver, may be readily explained by the difficulty with which the vena cava empties itself into the right auricle, and the hepatic veins into both; hence the marbled and blackish colour of the liver, hence also the sanguineous distention of the mesenteric, colic, hæmorrhoidal, and capillary veins of the intestines, hence, finally, the momentary relief almost always derived from the application of leeches.

Section VIII.

OF THE STATE OF THE BLOOD IN THE BODIES OF PERSONS WHO HAVE DIED OF DISEASES OF THE HEART:—OF POLYPI-FORM CONCRETIONS.

An alteration of the different tissues of the heart, produces derangements in the action of that organ, which necessarily disturb the circulation itself. This function disturbed in its central point, afterwards in the great venous and arterial vessels, and, finally, in the capillaries, causes physical and chemical changes in the state of the blood. It is these physical and chemical changes which remain to be considered, and which are the more deserving of attention, because some of the physical alterations, such as a coagulation of a portion of the blood before death, have themselves been ranked among diseases of the heart.

It is beyond all doubt that the chemical composition of the blood is altered in organic diseases of the heart. We want, it is true, a series of experiments to prove to the eye, the truth of this assertion, but every thing argues in its favour. How is it possible to conceive that the blood should preserve its natural condition, when the circulation is for months and even years disturbed, and as if subverted? How can it be imagined, that if this fluid be not moved with a given force and measure, no effect should thereby be produced in its physical and chemical constitution, in the quantity, quality and proportion of its elements, in its fluidity, plasticity, in the laws of its formation, reparation, &c.? May it not, on the contrary, be maintained that the more the circulation departs from its natural and necessary laws, the greater will be the change or disturbance in the blood, in the secretions, excretions, assimilation or nutrition, &c.

In fact, are not the elements of the blood altered, at least in their relative proportions, when it is aqueous and slightly coloured, particularly if this state be compared with that of the same fluid in some diseases of the heart, when it gorges the liver, has nearly the consistence of a syrup, and is almost black?

If in diseases, different from those which form the subject of this work, the blood is frequently found to have lost its colour or consistence, a fortiori, its chemical alteration is more to be expected in affections of the heart, which by the derangements they excite in the circulation, always produce imperfection, and even complete disorder in sanguification. *Senac* saw in a person whom he had ordered to be bled,

" the blood condense as it quitted the vein, and fall upon the cup like a string; its surface was whitish." *Bichat* found the blood in the system of the vena portæ altered, and *manifestly decomposed.* I have seen an alteration and decomposition still more general. In the fact cited by *Bichat,* the manifest change in the blood was confined to the system of the vena portæ; in my case, the alteration was general, since the blood, in the cavities of the heart, in the large arterial trunks, and even the smallest arteries of the extremities, was of a pale violet colour, and of a grumous consistence, like the lees of wine. Some authors say, that they have seen this fluid very thick, totally discoloured, &c. I shall not insist farther upon these kinds of alterations, as in the greater number of cases no mention was made of a disease of the central organ of the circulation. I should not even have made this digression, but to put the reader on his guard against the too rash opinion which, in all cases excludes, with confidence, humoral degeneration, and that of the blood in particular.

To explain more fully the various states of the blood, as well in diseases of the heart as in many others, I do not call in the aid of positive chemistry; as the experiments appear to me so difficult and so delicate, and the analogies so doubtful, that I can readily believe that the results would not for a long time, if ever, be such as might be expected from an *exact* science.

The state of the blood found in the heart of individuals dying of a disease of that organ, seems nearly the same in all analogous cases. All the information which I have obtained on this point, from a series of observations made in the Clinical Hospital, is included in what follows.

A. After organic affections of the heart, the blood is collected in greater or less quantity in the cavities of that viscus; and I know not that it has ever, when diseased, been found perfectly empty of blood.

B. The quantity, in some instances not very considerable, is, in most, so great as completely to fill, and even distend, all the cavities of the heart, and to give it a firmness not very readily overcome by pressing it with the fingers.

C. However considerable the quantity of blood in the heart may be, it still differs in its colour and consistence. When the disease has lasted long enough to bring on the serous diathesis, and the cavities of the body are filled with water, the blood partakes of this general serous state; and the cavities of the heart then contain fluid and light coloured blood. This, however, does not uniformly occur, and sometimes an opposite state exists; so unusual is it to see cases sufficiently uniform to fix a solid judgement. *Judicium difficile!* I have seen the blood in a person who died of passive aneurism of the left ventricle, so little coloured, that it gave but a very slight red tinge to a piece of white linen which was dipped into it.

D. At other times, and not the least frequent, when the disease has terminated quickly, or when the serous diathesis was not formed, all the blood contained in the heart is taken out of each of its cavities in one clot, the remnants of which come out with difficulty on cutting into the great venous or arterial trunks, or even into the auricles or ventricles. The colour of these clots is usually red, approaching to black. No better idea of this state can be formed than by

comparing it, as to colour, consistence and tenacity, to currant jelly rather overdone.

It has been said that the colour of the blood is always different in the two sides of the heart. This difference, which is observed during life between the arterial and venous blood, is not perceptible in that found in the heart after death: this at least is what I have gathered from comparing the blood in the two sides of that organ, in a great number of subjects.

Can death, which takes place in organic diseases of the heart and many others, be immediately owing to the presence of this black blood in the left cavities, to its deleterious action upon the brain, or to its defect of stimulus upon the heart and its nerves, &c.? Why, since it must necessarily have previously passed through the lungs, has it ceased to contract there a red colour, &c.? I am too little acquainted with this pathological physiology to be enabled to speak decidedly on these points, though from late experiments, and particularly those of *Bichat*, I am much disposed to answer the first question in the affirmative.

Such are the usual states of the blood at the end of organic diseases of the heart; but there is one which has been the subject of much discussion among physicians, without having reconciled their opinions, and on which I have not hitherto dilated.

Of Polypi-form Concretions.

The Polypi-form concretions, noticed by most practitioners, have, by some, been regarded as the

constant effect of death ; by others, as morbid substances formed during life. These two opinions differ essentially, because in the one case, these substances are the effect, while, in the other, they may be, and frequently are, the cause of death. This diversity of opinion, doubtless, arises from these concretions having been considered in too general a point of view, and from an inability to distinguish those which form after, from those which take place before, death. The limits of this Treatise do not allow me to spend much time in the discussion of these opinions, but I think it right to state that which appears to me best supported by observation. I therefore divide these concretions into three kinds :

1st. Those which are of longer or shorter standing, and which may be known by their pale fleshy colour, their density, their fibrous or fibrinous organization, and finally, by the force with which they adhere to some part of the cavities of the heart.

2d. The polypous-like concretions formed in the latter days of life : they are distinguishable by their yellow lymphatic colour, sometimes reddish, by a fibrinous disposition in places, (though they are mostly coagulated,) and by their excessively feeble adhesions.

3d. That kind of *magma* or *coagulum*, which I have compared to badly prepared currant jelly, which breaks under the fingers, adheres to nothing, has no fibrous or analogous appearance, and forms after death, by rest and cooling, by spontaneous elective attractions, varying according to the age, temperament, duration of the disease, and particular state of the blood. I readily confess that this division is

not quite correct, and offers, perhaps, rather three different degrees or states of the same thing, than well marked species; but I still think it exact in observation and useful in practice.

Here follow some cases which prove the existence of polypi of the first species, according to my division.

Case 55.—I saw, at the Clinical Hospital, the right ventricle of a heart affected with aneurism with diminished thickness of the parietes of that cavity, the whole internal surface of which had upon it a white, thick, fibrous, and tenacious lymphatic coat. This substance, entangled with the fleshy pillars, had contracted such close adhesions with them, that they appeared one body, and were with difficulty separated. The blood contained in this polypous bag was partly fluid, partly coagulated. On emptying the cavity from the fluid and clotted blood, and well washing it, the polypous layer was visible on its surface, smooth and scarcely tinged by the blood which it before contained.

Case 56.—In another subject, who died in the same hospital of a disease of the heart, I found, in the cavity of the left ventricle, a thick and hard lymphatic concretion which adhered strongly to the middle of the septum. After having detached this substance, which was done with much difficulty, I found the fleshy pillars entirely destroyed, where it had adhered; which proves that it had been formed and implanted there long before death, and that the pressure of the heart, during its contractions, had effaced the fleshy net-work, which must have been a process of considerable time.

On many other occasions, I have shewn to the students polypi-form concretions, usually of a yellowish white, and of a fibrinous structure, so consistent, tenacious, and intimately adherent to the internal fibres of the heart, that I cannot but admit as a fact, proved by experience, the formation of these concretions long before death; and the presence of which I have sometimes announced, before opening the body, from the symptoms of the previous disease.

These bodies may give rise to symptoms of diseases of the heart; but which do not appear to me sufficiently clear to enable the practitioner, in all cases, to establish a correct diagnostic of these affections. They generally produce only momentary symptoms, irregular in their return. When they float in the cavities of the heart, they do not cause any perceptible derangement in the circulation, except when the flow of blood brings them to the auriculo-ventricular aperture, or the mouth of the great vessels. Then, closing, either partly or entirely, the diameter of these orifices, they occasion palpitations and faintings, which are for the most part momentary, because they cease as soon as the concretions quit the apertures which they obliterated, to float more or less freely, according to the extent of their implantation to the parietes of the cavity of the heart which incloses them.

But when some of these polypous bodies are implanted into certain parts, they occasion constant symptoms. This particularly happens, as I have often noticed, when one of these concretions is entangled with, and strongly adheres to the valvular cords, or the valves themselves.

They must, in this case, nearly destroy the functions of these membranous sails, by rendering them nearly immovable, by the unnatural adhesions which they establish between them and the sides of the heart, to which these concretions also adhere.

The accumulation of the blood, its prolonged stay in the cavities of the heart, and a peculiar disposition of this fluid opposed to the serous state in which it is sometimes seen, appear to be the principal causes of the formation of polypi. Now all these circumstances are generally occasioned by an organic disease of the heart or its appendages. A diminution in the excitability of the organ, or in the stimulating property of the blood, may also be a cause of the accumulation or coagulation of that fluid in the heart, as it acts, in either of the supposed cases, but feebly upon that viscus, and certainly not so as to excite it to empty itself as completely and easily as in the fullness of health.

After what has been said, it will not be very difficult to distinguish polypous concretions, formed a considerable time before death, and which, from the symptoms, &c. maynbe considered as a disease of the heart, from coagulations formed in the last moments of life, when the heart can scarcely empty itself again, or in the interval between death and the opening of the body.

The existence of these two latter species is so common, that I think it unnecessary to bring forward instances of them.

These latter coagulations, red, and for the most part gelatinous, resemble, in some respects, the former; but still there is a material differ-

ence, inasmuch as they are more easily broken between the fingers, have no fibrous-like texture which allows them to be torn into thongs, and rarely contract adhesions with the internal surface of the heart; such adhesions also, when they do occur, are extremely slight.

It is not in the cavities of the heart alone that coagulations are found; in many cases, and in many other diseases, besides those of that organ, lymphatic or fibrinous, and whitish thongs are often observed, sometimes cylindrical, sometimes flattened, and usually much smaller than the tube which contains them, extending into the aorta, the arteries which rise from it, and even the inferior order of vessels: these coagulations, like those just spoken of, are produced in the last moments of life, by the elective attractions of the molecules of a fluid, which is not sufficiently agitated by the dying action of the heart, or after that organ has ceased to act for ever.

Note.—Not being perfectly satisfied with the word *whistling*, as descriptive of a peculiar noise in breathing in aneurisms of the aorta, and some diseases of the heart, I think it right to state that I have always used it for the French word *sifflant*. T.

SUMMARY CONCLUSION.

If the history of the diseases which form the subject of this work be not complete, (as is proved by the facts which are multiplying every day) it at least suffices, and that even superabundantly, to prove, that organic diseases of the heart are very various, almost always complicated with each other, and of an alarming frequency.

That, *nature, every where so ill defined, and still worse understood,* whose provident wisdom has been too much extolled, furnishes, from the very beginning, the proof of her own errors, in the hereditary or innate disorganizations which give rise to these diseases.

That, their exciting causes are extremely numerous, and, for the most part, not to be avoided; and that man, both in his physical and moral constitution, finds, the frequent, necessary, and melancholy source of these affections, and of death, which is almost always their inevitable consequence.

That, the empire of all these causes is the more powerful, and their action more necessarily fatal, from their obscurity at the beginning, which art has not as yet discovered the means of removing.

That, when they have once given rise to proximate causes, that is to say, to induration, thickening, ossification, obliteration, &c. of any part of the organ, the evil, then first perceptible, is already nearly beyond the efforts of art.

That, no age nor sex is exempt from these affections, less frequent, however, among children and females. The delicacy, and suppleness of their fibres, their, perhaps, milder humours, less energy of ossification, greater mobility, and consequently more vivid passions, but less deep or fixed affections, employments that require less exertion and less strength than those of men, account for this diminished frequency in women and children.

That, the diagnostic in organic lesions of the heart has attained a rare degree of precision, which leaves little to desire, and which has not been, and, I dare affirm, never will be, reached in many other diseases: the cause of this is, that the derangement in the action of many other organs will always be more difficult to perceive, by reason of the nature of their functions, and the phenomena which discover them, than the disturbance in the action of the heart.*

That, the prognostic, in the confirmed disease, is unhappily too certain; and that then the truth of the motto to this book, finds but too correct and lamentable an application: *Hæret lateri lethalis arundo.*

That, no treatment can be used when the disease has not evinced its presence; that, when it first displays itself, medicine might be serviceable, and even sometimes curative, if mankind were more reasonable, more conformable to the advice of the true ministers of the art, not carried away by ridiculous prejudices, false shame, puerile vanity, unreasonable incredulity,

* This truth is susceptible of much developement, but it does not enter into my plan.

fatal absurdity of judgment; whence arise a carelessness and negligence, which accelerate the progress of the disease, while the patients, a prey to regret, agitated by passion, cast down by despair, perish long before the period which they might have reached; accusing, with an injustice, more afflicting to the heart than wounding to self-love, the sensible and enlightened physician, whose prudent and salutary counsels were rejected at the time when they might have been useful.

FINIS.

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